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approach

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THE NAVAL AVIATION SAFETY REVIEW

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IN THIS ISSUE

Photo page 30, courtesy of Douglas Aircraft Co.
Drawing page 37, courtesy of North American Aviation Inc.

FORECAST—IMPROVING

This month's cover recognition of the weather problem is literally symbolic—a representative selection of the many signs and symbols which are the language of the weatherman.

Note too, that this "front" cover theme is carried over to the back cover to present an equally important aspect of the weather scene—the Aerologist himself.

Because the weather has become a significant instrument in aerial warfare, pilot and aerologist are critically dependent upon each other for the information which will increase their weather perception.

On page 4 you'll find a yarn with a new twist on this subject, and if your analysis of this weather situation is the shrewd one we anticipate, we can confidently forecast a steady improvement in naval aviation's weather problem.

Page 12

LANDING THE P2V—P2V's have a control gismo different from any other naval aircraft. Lockheed Test Pilot Jay Beasley and leading naval instructors tell about this seven letter item and other secrets to successful Neptune landings.

Page 26

THE LONG AND THE SHORT OF IT—Did they laugh when you sat down and ran off the end of the runway? Are you in the habit of leaving the first third behind before touchdown? Do you seem to always get the bad brakes? It's just a matter of touch and whoa.

Page 35

NOTHING BUT THE TRUTH — Today's straight-gulleted stovepipes, capable of slurping go-juice up to five times faster than the thirstiest of recips, point up the importance of accurate fuel gauge calibration. Herewith a few pointed tips on how to calibrate the gages accurately.

Letters to the Editor

Letters may be forwarded either via official channels or direct on Anymouse forms. While all letters should be signed, names will be withheld on request. Address Approach Editor, U. S. Naval Aviation Safety Center, NAS Norfolk 11, Virginia.

GO, YES, GO

Sir:

. . . In the light of a recent OpNav Instruction plus the record of serious damage, injury and even death to persons attempting flameout landings I question your "Old Pro Club."

The March issue cited a young pilot who, with only 14.3 hours in one aircraft model, attempted and made a flameout landing.

Granted he saved the Navy a valuable plane but was he such an "Old Pro" to take the gamble with the odds so heavily against him? Yes, he did win the gamble this time but will he be so lucky next time? What of all the new pilots who read your commendation? Will they be able to save the airplane or will they end up a statistic?

Lord knows I am not the one to judge that he did the right thing but if OpNav and the statistics say bail out then out I go and your "Old Pro Club" be damned.

JACK E. COOPER, Lt.
JTTU, NAS Olathe

You're so right. Go, go, go is usually the right answer. But cases are sometimes different. This pilot became an OLD PRO in Sept '56, and the OpNav is dated 1957. Nonetheless, our apologies for letting our lead time get excessive, and our selection confusing.—Ed.

TOUCHÉ, MR. LSD

Sir:

. . . Caustic comments about us poor old "desk jockeys" quite frequently appear from pilots in your letters section. Let's face it! There are a lot of aviators who are desk jockeys. Many of these want to remain desk jockeys. But probably most of us are in this "paper pushing business" through no choice of our own. Alas, I am one of these, I have spent the past three years ashore in a proficiency flying billet and have just received orders to a staff despite all my requests for a squadron. This means that the next two years will in all probability also be spent grinding around at the rate of 8.3 hours per month in a good old *Beechcraft*. . .

I realize that I am discussing a complicated situation which involves career planning, rank structure in the Navy, officer personnel detailing and many other aspects of personnel administration. (I also mean to confine my remarks to Group I aviators.) My point is this: There are many aviators, who want to fly, that put up with these enforced periods of proficiency flying as gracefully as possible, looking forward to the day when they will be back doing what they want most to do, and what they take most pride in doing. I think that it should be made a matter of policy that aviators should not be kept in

Please turn page

LETTERS
Continued

a proficiency flying billet for any one period of more than three years.

Another point . . . the Navy put instrument flight training on a paying basis by setting up the FAWTU system . . . Why not a similar setup to provide service aircraft and a thorough checkout and training syllabus for each model for proficiency pilots based in a particular locality?

. . . Such a system would pay big dividends in letting all aviators really maintain and even enhance their proficiency as professional pilots . . . the overall accident rate would eventually be lowered. Last, but not least, many of us "LSD" drivers would have another way of keeping up with all the developments . . . Aviation and airplanes are becoming more complicated by the minute.

One could even argue the point that naval aviators spend all their time as aviators. But, I'll settle for it any time, if I can't have it all the time.

We, too, want to feel like members of the team.

SHELDON L. CORNER, Lcdr.

Closest thing we have today serving limited groups are units such as JTTU. Any other comments?—Ed.

SWITCHEROO

Sir:

A little late but in case no one else has said anything—ComAirLant dispatch 192233Z listing change 2 to 3750.6B says to list dollar cost in Sec. 18 of FLIGA form. Wouldn't Sec. 15 be better?

BILL BARRON, Lt.
VA-85-Oceana

Yes and No. Section 15 is applicable for FLIGA form revision dated 11-55, but on revision dated 10-56 section 18 is "damage to government and private property."—Ed.

SAFETY IS BASIC

Sir:

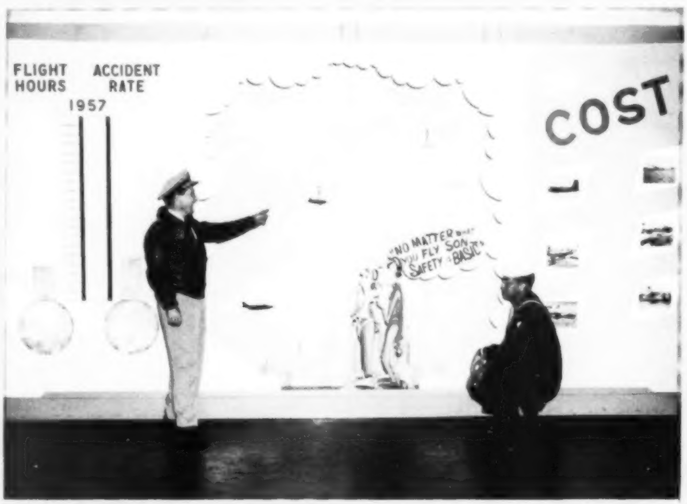
Here is a photograph of our new aviation safety display. It is 3-dimensional, and the aircraft you see in the picture move from left to right by means of a cable-pulley arrangement. The speeds of the aircraft vary because of different size pulleys. The display is powered by a small electric motor. The left wing of the display allows one to see at a glance the number of flight hours to date, and the accident rate. The "mercury" in the thermometers is adjustable. The right wing shows photos of recent accidents.

The entire cost of the display did not exceed $35 as most parts were "scrounged."

The basic display was designed by myself and DM3 Barbarin, who appears in the picture. The painting and fabrication was done by Barbarin and AM3 Scardino, both of this station.

This display is readily adaptable to a change in theme, and the motto that Grampaw Pettibone is whispering into Dilbert's ear can be changed in minutes.

In case other stations are interested in building a semi-permanent display of this sort, we will be happy to furnish a list of ma-



A bit of Mardi Gras showmanship gives safety a boost at NAS New Orleans.

terials and rough set of plans.

J. C. MAZZA, Lt.
NAS New Orleans

THREE GREEN, PLUS

Sir:

I read with great interest your "See It Now." [Feb 1957 *Approach.*] It was an excellent exposé of the situation. I'm sure that your desk is now piled high with "gems" of wisdom from other naval aviators who have had suggestions on the "problem." Please let me add mine.

Having been assigned to duty in the Advanced Training Command at Kingsville in 1952, I had the pleasure of flying the early editions of the TV-1 and 2. These aircraft really looked like pinball machines prior to takeoff or landing. Many of the warning and safety lights have been eliminated in later versions of the aircraft, including, as you know, the "three in the green." I think that the three green lights employed as landing gear checks were some of the best indicators I've seen.

Mounted, as they were, high on the left side of the instrument panel, they just about "hit you in the eye" as you turned base for landing. As you remember, a red warning light was used to tell the pilot when the gear was unsafe. This coupled with the lack of the necessary three green lights made an excellent landing gear check. This light system had one major disadvantage. At night, (if you forgot about the night shades), the lights would just about drive you out of the cockpit when the old gear locked into place.

. . . I wonder what the statistics could tell us about the landing gear light system in these aircraft. I feel that the wheels-up rate may have been a bit lower.

What would I suggest? I don't want more lights in the cockpit, but perhaps a two-light system could save some of us from frustation and the long green table. One red light for unsafe condition and one green when all three gear are down and locked. The red light might be tied to the airspeed indicator to come on below a certain indicated airspeed, if the pilot hasn't moved the gear handle to the down position.

On the highway *green* means go. In the air it could save all of us taxpayers a pile of *MPC* plus our necks.

ALBERT J. FRAINIER, JR., Lt.
USS HORNET

WHEELS PRIZE

Sirs:

. . . (As) A very effective . . . method of preventing wheels-up accidents, saving a lot of wear and tear on the poor, ol' wheels watch, and putting some much needed cash in the pockets of the guys who are doing such an important job . . . I propose that all pilots who make a wheels-up pass be fined a token fine, say, $50.00, which would be given to the wheels watch(s) who made the save.

. . . Proof by the wheels watch must be accompanied by at least one witness or the program might get out of hand.

. . . I ran the suggestion through the exchange officers of this staff, and it appeared to get favorable endorsement. We might be the first to come through with the cash!

W. R. BARTOSH
LtCol USMC
HqBn, G-3, 1stMarDiv
Camp Pendleton, Calif.

Colonel, we're for your suggestion 101%—any pilot who has his "dignity" saved should be happy to offer a reward. However your price may be a little steep for junior birdmen with families.—Ed.

JET WEST

Sir:

Enclosed is an article and photo we hope you will be able to use in Approach.

Ever have trouble balancing your Jet West on your knee during an

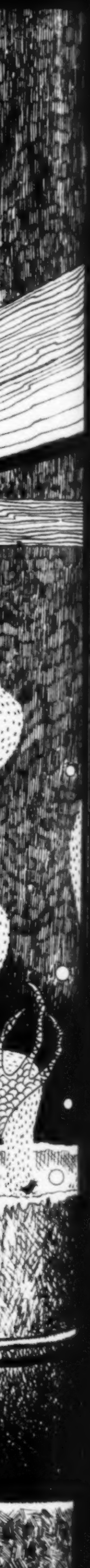
actual IFR penetration?

Our F4D-1 squadron has sólved this delicate problem by attaching a knee-strap to the booklet. The strap is attached to the book by snap-fasteners and is also snap-fastened around the pilot's leg for use. The result is that the Jet West, opened to the correct penetration chart, is available for instant reference throughout a penetration without the pilot having to balance it like a teacup on his knee.

This AirPac squadron believes that this strap will also work with the Jet East.

C. A. KNIGHT, Cdr.
CO VF-23
Moffett Field


OLD
TENNIS
SHOE
TO BE HEXED



The Aerologer's Apprentice

Had he *been asked to comment on the subject of aerology, Wm. Shakespeare (a writer) might have had his Three Witches of* MACBETH *chant something like the following:*

Round about the cyclone go;
In the day-old sequence throw.
Fog, that under polar front
Eludes the weather-guesser's hunt.
Half a portion of briefing got
From observations at the joe pot.

Double, double bird-dog trouble
St. Elmo's fire on canopy bubble.

Precipitate of nimbo stratus
Pseudo-wet-bulb condensatus
Eye of hurricane, rime of ice
Add occluded warm fronts twice

Scale of Beaufort, green card moss
Nugget's wings on the table toss.

Mayday! Mayday! on the double
Request a steer, have position trouble.

Tooth of typhoon, willi-waw claws,
Isobar tracks and tropopause,
Gall of neophyte, slips from grace
One pint cold sweat from ace of base.
Needle, ball and ripcord——so,
Three for flightpay and vertigo.

Rubble, rubble, in cornfield stubble
We had the weather, had they taken the
trouble.

Please turn page

The Aerologer's Apprentice

Continued

LIEUTENANT "Flip" Coyne, aerologist extraordinary, hunched futilely against the driving rain that lashed the waterfront alley and tugged at the latch of a warped green door.

"Jumping Jupiter Pluvius!" Coyne gasped, half blinded by the rain and his own angry tears, "I'll swear it must be W2X ¼ TRW + 993/49/48↘45+55!"

Cringing under the fury of the Beaufort Ten which tore at his trenchcoat, the aerologist again lunged against the obstinate door. This time, and with a protesting screech of rusted hinges, the weatherbeaten portal swung open and Coyne staggered inside.

As his eyes gradually became accustomed to the gloom, Coyne repressed a shudder. The place was even more repulsive than he'd remembered from his previous visit. The air was foul with things unpleasant to nose and eye.

Grotesque wax dolls, shrunken heads, dried toads and other horribly suggestive objects littered the one table or dangled from smoke grimed walls. Suspended in the fireplace was a seething cauldron which bubbled evilly and emitted unspeakable odors.

Beholding this, Coyne was momentarily shaken in his grim purpose, but a particularly loud shriek of the wind outside reminded him of the wrong which had been done him.

"Alright!" He roared into the smoky murk, "Come on out of there, you phoney old broomstick jockey! I know you're here!"

For a moment the silence was broken only by the splatter of the rain on the roof, then there was a rustling from a far corner of the room. A dreadful old crone materialized from the shadows.

"Something we can do for the pretty sailor boy?" She had a mouth like a torn hip pocket, and generally speaking, she was even less attractive than the filthly parrot which perched on her shoulder. Coyne shook his fist under her nose, which wandered over her face considerably.

"Danged right you can, you crummy conjurer! You know who I am! You said you could cast me a nice spell of ○15/203/64/41↖8; just one lousy little batch of ○15/203/64/41↖8 was all I asked!" There was a catch in Coyne's voice as he continued. "So I could prove to the pilots at the air station that I really could predict the weather accurately." His voice became more menacing.

"Forty bucks and two cartons of cigarets I paid you for one simple, sure sequence of ○15/203/64/41↖8, that I could forecast in advance and make those characters take back all those cracks about weatherguessing.' "

Coyne's voice rose to a snarl. "So what do I do? I go back and write up the cotton-picking forecast—without even looking at the charts. And what happens?" The aerologist's shriek drowned out the fury of the storm raging outside.

"Instead of the weather I contracted for, I get *this!*" He waved his arms toward the storm outside.

All during this tirade, the parrot on the witch's shoulder shuffled nervously and clucked profanely into the witch's near ear.

"I *told* you," it rasped accusingly, "I told you about using them lousy ready-mix potions. You ain't cast a spell that would stay put since Merlin gave you that sorcerer's disposition board. And wait'll the union hears about this fouled up . . ." The rest of the comment was lost in a loud squawk as the witch slapped the parrot head over tailfeather into a corner.

Managing a horribly weak grin, the witch shrugged philosophically at the aerologist's misfortune.

"Nn-now, simmer down, sonny," she quavered, sidling away from the aerologist. "And put down that crystal ball. They cost money." She cringed further away from the threatening figure. "Besides, anybody can make a little mistake . . ."

"Yah," growled Coyne, "and this 'little' mistake is gonna cost you—plenty." He tossed aside the crystal ball to pick up a smudged meat cleaver which lay on the table.

With slow deliberateness he forced the witch into a corner. The crone glared about wildly for escape—there was none . . .

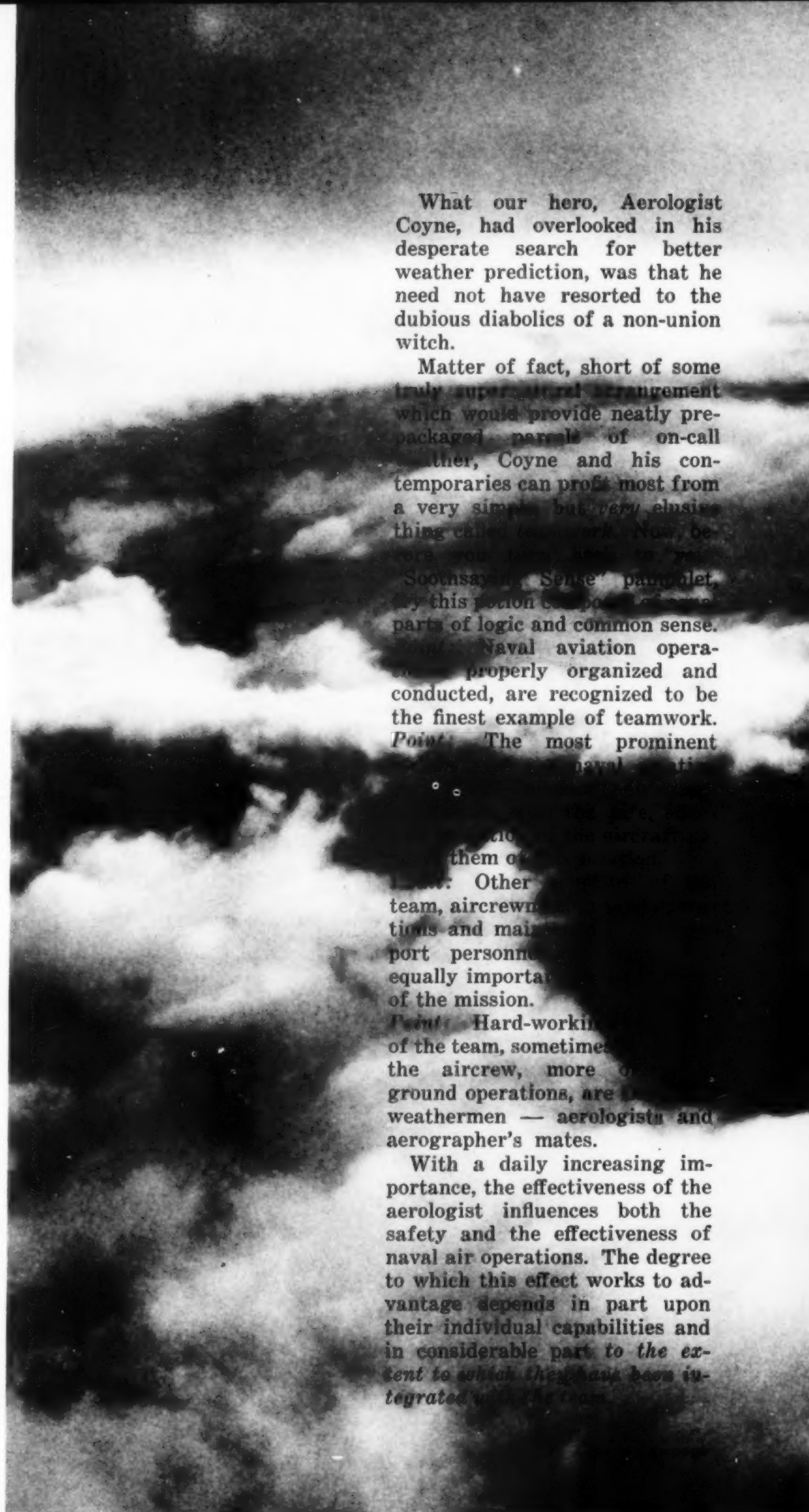
In his quarters a few hours later, Coyne finished washing the soot and charcoal grime from his hands. As he changed into a dry uniform he felt no slightest twinge of regret for the scene he had left behind the mysterious green door near the docks. He even hummed a bit as he prepared to report to the aerology office.

Only later, at the flight briefing desk, did his face fall into its customary pattern of worried concern as he bent in routine perplexity over a DD 175.

"There must be some secret to this business," he muttered, "some hidden key to getting hold of *all* the weather information I need—some source . . ."

And back in the foul smelling room behind the green door, a bedraggled parrot with one drooping tailfeather paced back and forth on a dusty table from which it could peer out at the still raging storm. Occasionally, the parrot paused to squawk disgustedly at a disinterested, newly shrunken head which hung over the fireplace.

". . . If I told you once, I told you a thousand times—'If you wanta cast a proper weather spell', I said, 'Don't *go mixing up them sequence reports' . . ."*



What our hero, Aerologist Coyne, had overlooked in his desperate search for better weather prediction, was that he need not have resorted to the dubious diabolics of a non-union witch.

Matter of fact, short of some truly supernatural arrangement which would provide neatly prepackaged parcels of on-call weather, Coyne and his contemporaries can profit most from a very simple but *very* elusive thing called *teamwork*. Now, before you [illegible] "Soothsaying Sense" pamphlet, try this potion [illegible] parts of logic and common sense.

Point: Naval aviation operations, properly organized and conducted, are recognized to be the finest example of teamwork.

Point: The most prominent [illegible] naval [illegible] them o[illegible]

Point: Other [illegible] team, aircrewm[illegible] tions and mai[illegible] port personn[illegible] equally importa[illegible] of the mission.

Point: Hard-workin[illegible] of the team, sometime[illegible] the aircrew, more [illegible] ground operations, are [illegible] weathermen — aerologists and aerographer's mates.

With a daily increasing importance, the effectiveness of the aerologist influences both the safety and the effectiveness of naval air operations. The degree to which this effect works to advantage depends in part upon their individual capabilities and in considerable part *to the extent to which they have been integrated with the team.*

A joint approach to the weather problem, by pilots and aerologists working together, will pay magical dividends. Forecaster service is now available *during your flight,* courtesy of some 90 Air Force Pilot-to-Forecaster Stations in the U. S. alone. Check the remarks column of your RadFac, and give METRO (pronounce MEETRO) a call on 344.6mc, 137.88mc, or if you have VHF only maybe you can go through the tower.

In the absence of pertinent operational information, the weatherman must work alone and, operationally speaking, in the dark. His contribution to the team becomes severely limited.

On the other hand, fully informed and mutually supported by the other team members, including the pilots, the weatherman can be a significant factor in the success of the mission.

However, there are basic differences between the pilot-aerologist relationship, and the relationship of the pilot with other members of the team.

For example, air controllers, flight line personnel, maintenance and servicing crews are all supervised by pilots who know, or should know, as much about the job to be done as those who are assigned to do it.

Not so with the aerologist. Few pilots have had other than basic training experience in analyzing a weather map, in preparing a forecast, or in briefing aircrews on the weather.

Even fewer Navy aerologists are pilots.

Hence, an understandable gap exists, and there are reasons why this gap may increase rather than decrease in the future.

The business of flying aircraft is becoming increasingly complex, and so is the business of weather forecasting. Less and less time is available in flight school or in aerological training for instruction in the other man's business—no matter how beneficial this instruction may be.

Conversely, the need for mutual understanding of flight-weather problems becomes increasingly critical as aircraft performance and mission become increasingly dependent upon *knowing* the weather.

But there's hope for Lt. Coyne and his harrassed colleagues to close the gap. A joint approach to the weather problem, by pilots and aerologists *working together,* will pay magical dividends.

If you've ever been so fortunate to see this mutual pilot/aerologist coordination in operation, you already have evidence of its value.

A good place to start in on this coeducation of problems is in the area of aircraft characteristics. Discussions by pilots, even of the readyroom joepot variety will acquaint aerologists with certain critical features to be kept in mind during weather briefings.

For example, the necessity for pilots to avoid thunderstorms and icing layers in certain jet aircraft, for reasons entirely apart from the usual turbulence and icing hazards, is not too well known or appreciated in aerological circles. As has often been pointed out, compressor shroud failure and possible engine seizures may result.

The "coffin corner" effect, or oscillation between buffet and stall in turbulent areas at high altitudes, is a familiar experience to most pilots and is accepted as a regrettable but unavoidable circumstance.

Few aerologists are aware of this problem, or the fact that voluminous papers in the meteorological literature bear directly upon it. A study of available information and discussions

on a continuing basis with pilots who encounter turbulence at high levels will increase the aerologist's capabilities for providing helpful information in weather briefings.

"Coffee-break" sessions on the all-weather capabilities of various aircraft will reveal a number of items of preflight weather information of value to the man "in the soup."

From these discussions may evolve what might be called "pre-emergency" weather planning. What to do in the case of communications failure in instrument flight is a frequent and vexing problem. The finest all-weather aircraft becomes just another VFR bird when communications with the ground are lost. The pilot must find a clear area where he can orient himself visually.

Should he climb, descend, turn right or left, go straight ahead or make a one-eighty? Air traffic and terrain considerations will play a part in his decision to be sure—yet knowledge of the weather situation, not necessarily along his original flight path, but anywhere within flight range will be a deciding factor.

Similar considerations apply in other types of in-flight emergencies. Engine failure requires an immediate decision based upon several critical factors. The roughness of the sea, sea water temperature and low cloud or fog conditions will bear on a decision to ditch, versus bailout or ejection. Over land areas pilots have been known to descend or bail-out in clouds when clear weather was within gliding distance. Preflight briefing on what might be done if something happens is money in the safety bank. Another factor requiring clarification is the subject of runway visibility.

Every pilot knows he has a problem when the visibility at his terminal is reported to be one mile or less. Pilots may not be alerted to the fact that they may have a problem when the visibility is reported to be three miles or more.

The pilot interprets the visibility report as the distance at which he will be able to see the runway on his approach. The aerologist is reporting something quite different.

The pilot's visual detection range may be less than one-third of the reported visibility.

Under certain conditions of atmospheric brightness, and runway contrast, the pilot may not see the runway at all until *just prior to touchdown.*

This is a serious problem and it does not lie entirely in the aerologist's area.

Pilots and aerologists working together can reduce the impact of the problem on aviation operations. Relatively simple measurements can be made of the factors affecting the pilot's visual range to various runways. Routine daily and seasonal variations in the measurements will be noted. Correlation of these measurements with the aerologist's measurement of visibility will produce a figure much closer to what the pilot actually experiences.

This information on flight clearance forms or in tower advisories to approaching aircraft will *be most helpful.*

Pilot reports on the weather encountered in flight aid the aerologist considerably. Pireps on haze encountered aloft, the tops of thundershowers and the levels and thickness of cloud layers *are the only direct information he receives on these phenomena.*

Individual or squadron coffee break sessions with the weather guessers may evolve valuable "pre-emergency" weather planning—. such as what to do in case of communications failure under IFR, and other weather related probabilities.

Unfortunately the facilities for relaying this information to the aerologist are severely limited. Airways communication stations and control towers are among the busiest places in the world. Only the most obviously important weather information can be relayed.

A possible solution is the installation of a speaker tuned to tower frequencies or a small multi-channel receiver in the aerology office. Aerology personnel and pilots awaiting clearance can then listen to the reports di-

Please turn page

SPECIAL NOTICE: A new in-flight weather safety service being introduced by the U. S. Weather Bureau and CAA is known as FLASH ADVISORIES. Currently valid FLASH ADVISORIES will be included in the scheduled weather broadcasts of CAA stations within 200 miles of any area of potentially hazardous flying weather. Details of this new system, presently on an operational test basis, may be found on page 7 of the 5 March AIRMAN'S GUIDE.

Painstaking efforts are made 24 hours a day in your behalf. If you in turn will religiously bend the weather man's ear with timely PIREPS, the effectiveness of current and future forecasting will be greatly enhanced. When aloft you are in a position to provide info that is impossible for your forecaster to get in any other way.

rectly—type of "you are there" proposition. There are, perhaps, many reasons why this cannot be done although it does not seem to be a difficult thing to accomplish and might prove to be quite valuable. Postflight briefings can help in this respect.

As a final step in the approach to an understanding, the pilot and the aerologist may find it constructive to analyze the arrangement of the aerology office, its relation to the flight planning facilities and clearance desk.

Aerology is the aerologist's home, at least when he is not off on some collateral duty, so too much violence should not be done to his ideas concerning its arrangement.

Usually, however, several features may be found which can be improved from the pilot's point of view. The changes required are relatively minor. In many cases the aerologist will find that the changes will serve *to simplify his functions* as well as make essential weather information more accessible to pilots.

An aid in considering the rearrangement of the office is a type of consumer-research. Like the industrialist or commercial operator, the pilot/aerologist team may evaluate the principal functions actually performed most frequently.

Is the office arranged to facilitate the production of a daily forecast for today, tonight and tomorrow and an outlook for the weekend, when the bulk of the information and forecasts issued are for flights of two hours or less? The longer period forecast requires detailed analysis of weather over wide areas and at several layers above the earth. The short period forecast requires a continuous evaluation of weather data over a much smaller area. The longer period forecast is important for general station use as well as in the planning of garden parties, picnics and hanging out the wash. But it is time-consuming and in the meantime pilots must be briefed by the office help, some of which may be fresh from recruit training and "A" School.

If the consumer research survey reveals that 90 to 95 percent of the information issued is for short periods it might be well for the aerology office to be geared for this type of work.

Actually, the long period forecast can be obtained with a minimum of time and effort from the incoming teletype circuits. Six-hourly, twelve-hourly and up to five-day outlooks are available for the taking. They have been prepared by personnel who in most cases have equal or greater experience and in some cases much more information and resources than are available locally.

It is true that in some cases these forecasts will be incorrect, as will be a product produced locally on occasion. The authors of the teletyped forecasts have never been known to complain of plagiarism, however, and the use of their product can remove a sizable burden from the aerological workload in some instances.

The survey may also reveal that, with the office geared to the presentation and briefing of short period information and forecasts, many of the pilots at the activity are unable to avail themselves of the complete picture.

Squadron readyrooms at large bases are separated from the aerological facility, in some cases by miles. Limited weather information in the form of general forecasts and a daily weather map are posted. A last minute call to aerology for the latest dope must suffice before a sizable group of the pilots depart on an operational mission.

Closed circuit television offers a solution to this problem. Navy, Air Force and Weather Bureau projects have been established to evaluate the usefulness of closed circuit TV for pilot briefing and in each case the evaluation has been most successful. Consideration should be given to this technique for bringing the weather to the pilot where operationally justified.

There are many other considerations which can and will be developed as the pilot/aerologist program progresses. Local ingenuity and initiative will provide the answer to many of the problems generated by weather factors. Teamwork will insure that there is a mutual awareness of the problems which may be encountered and that the solutions are applied as rapidly and as effectively as possible. ●

The Naval Aviation Safety Center is indebted to Captain R. J. Williams, USN, for material from which the foregoing discussion is presented. Designated a naval aviator in 1940, Captain Williams' wide range of aviation weather experience is presently being employed on the Staff, SACLant, where he holds the post of Director of Meteorology.

MONITOR

EXCERPTS FROM REPORTS BY NAVY SAFETY COUNCILS THROUGHOUT THE WORLD, WHO PROVIDE LOCAL LEADERSHIP AND EMPHASIS TO THE NAVAL AVIATION SAFETY PROGRAM.

Field Arresting Gear Lighting—A requirement exists for marking the location of the field arresting gear for night use. Pilots intending to pick up the arresting cable on a night landing need some type of lighting to indicate the position of the cable on the runway. As an interim measure, Moffett and Alameda will utilize small red blinker obstruction lights at the arresting gear location.—*FAirAlameda—NABs 12 ND*

Maintenance Safety Officer—An officer in the maintenance department should be assigned the responsibility for safety follow-up and to be sure that maintenance safety items were called to the attention of pilots.—*ComFASW-1 Sub Area*

Negat Expedite Taxi—It was reported that the control tower was directing expeditious clearance of runways. This is considered to be a possible contributing factor to taxiing accidents, especially in the case of junior pilots who considered the tower's directions to be "word of law." It should be re-emphasized to all pilots that they are in command of the aircraft and that tower directions that improperly hazard the aircraft should be reported to the Operations Officer—*FAW-6*

Morphine Issue—The Flight Surgeon is making up packets of morphine syrettes to be issued to a pilot of each flight in the same manner as pistols and courier cards. Classes on the use of morphine are being conducted.—*VR-23*

Treating Eye Injuries—The Flight Surgeon stated that people have been coming to the dispensary with small foreign particles in their eyes, but in many cases the men are waiting for two to three hours after the particles enter their eyes before reporting for treatment. All activities should impress upon their personnel the importance of receiving immediate treatment and thereby reducing the possibility of damage to their eyes.—*Brunswick Sub-Area*

High Speed Refueling Area—Reports were received that tractor drivers were taking short cuts off the hard surface areas in returning to the fuel pits. As a result, foreign objects were being brought into the fuel pits on the tires. Mud, stones and pieces of asphalt were reported to be clinging to tires and constituting a foreign object hazard to aircraft engines when they drop off.—*FAirAlameda—NABs 12 ND*

Taxiing Accidents—The means of combating taxi accidents outlined in the 18-24 February 1957 Weekly Summary of Major Aircraft Accidents was discussed. The taxi director training program will be reviewed and the safety officer will conduct a continuing indoctrination program for the pilots, both aimed at avoiding taxi accidents.—*VR-32*

High Visibility Flight Gear—A pilot who was forced to eject from his plane landed successfully in a barren area. The helicopter pilot sent to his rescue spotted him from a distance of four miles due to the fact that the downed pilot was wearing a high visibility type flight suit. It was pointed out that many squadrons have added bright colors to flight suits or manufactured bright colored scarfs to assist in spotting during search operation.—*FAirAlameda—NABs 12 ND*

Test Pilot Talks No. 12, by Jay R. Beasley, Lockheed Aircraft Corporation

An important factor in successful P2V landings, and a flight control device peculiar to this aircraft, is the varicam, located between the horizontal stabilizer and the elevator.

LANDING THE P2V

Techniques used in landing a P2V differ slightly from those employed for other airplanes of the same category.

This difference lies in the use of the varicam, which may be thought of as a trim device during cruise flight, and as part of the elevators during landing.

The varicam surface, which is hinged between the horizontal stabilizer and the elevators (see picture above), tolerates a wide range of C/G. Operated by hydraulic motors, its speed of travel is approximately one-half degree per second. (In older series, electric motors are used with speed of travel about 1-degree per second).

Thus, some amount of anticipation must be used during the flareout and touchdown. It is *not* desirable to "lead" with the varicam to the extent that the pilot would be exerting forward pressure on the yoke—the proper technique is to keep the airplane trimmed throughout the approach, applying nose-up varicam as the flare is rounded out. The amount required should be proportionate to the amount of elevator required for the touchdown, which will vary with the C/G, speed over the fence, approach angles and flap extension.

A smooth landing with full flaps extended is improbable without the use of varicam due to the limited effective area and up-throw of the elevators.

In general, most hard landings are caused by an insufficient amount of up elevator—in this case,

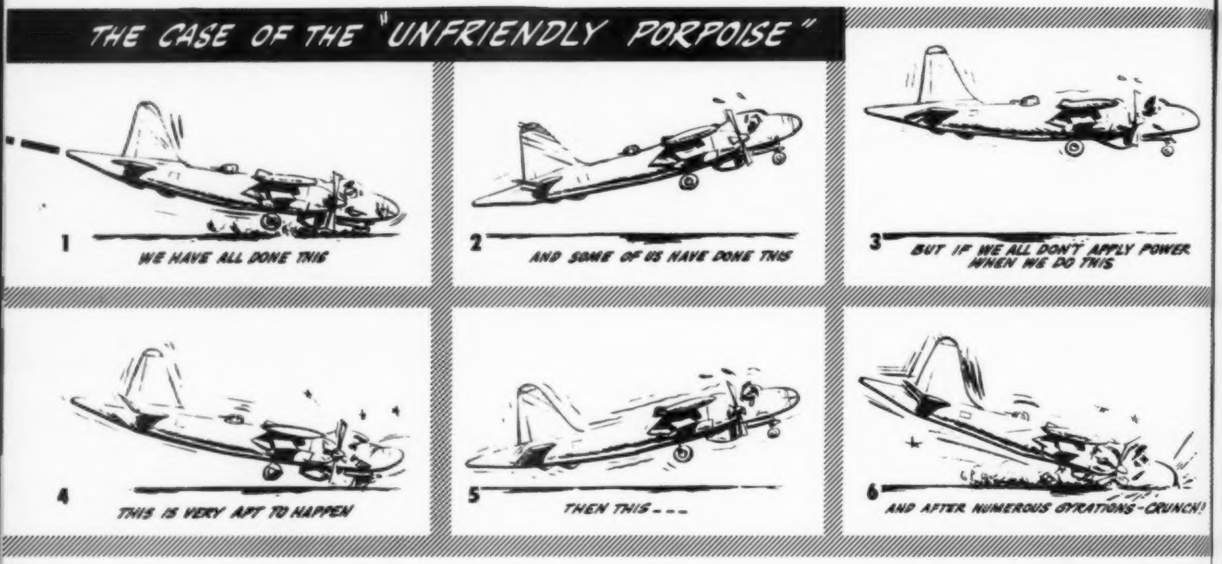


Illustration Courtesy of the Author

LANDING THE P2V Continued

varicam—prior to reducing power during the flare-out. This can be the result of dragging the airplane in on final approach with a necessarily high power setting; when the power is reduced, the nose drops and there is not enough time to apply nose-up varicam.

Many of the P2V landing accidents have resulted from normal approach landing patterns being interrupted or modified. Therefore, straight-in or modified approaches should not normally be employed during VFR when it is practicable to make a normal approach pattern which includes a downwind leg. (Practice straight-in approaches should be included in supervised training to provide pilot experience for emergency landings and instrument letdown or GCA finals.) Pilots are especially cautioned to beware of the expression "3- (or 4-) to-go" when completing the landing checkoff list!

Traffic Pattern and Approach

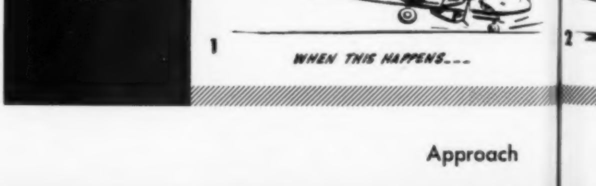
For a normal traffic pattern approach, extend 10 degree flaps early on downwind leg and attain a desired speed of 150 knots, 1000 feet of altitude above the runway elevation. With a setting of 2200 rpm, Mixtures: NORMAL, this should require approximately 25" Hg. Manifold pressure. Abeam the approach end of the runway, extend the landing gear, obtain a gear check from the crewmembers, and complete the landing checkoff list. Without changing power, the airplane will slow up about 10 knots and commence descending at about 500 fpm.

As soon as the wheels are down and checked, turn into base leg and extend flaps to 20 degrees which will slow the airplane to about 130 knots.

Flap extension causes a momentary nose-down pitch which can easily be trimmed out with the varicam. Make the turn into final at 125 knots and extend full flaps at pilot's discretion. Increase RPM to 2600 and reduce power as necessary to cross the fence at 105-110 knots. During flareout, apply nose-up varicam and continue the power reduction. Approximately 4 to 6 degrees of up varicam will produce a smooth landing.

Normal Landings and Rollout

Jet engines are not customarily used when landing due to possible jet engine damage incurred by



foreign objects being drawn into the jet air intakes when reverse thrust is applied to the reciprocating engines. Jets may be used on touch-and-go landings or when emergency situations dictate (i.e., loss of a reciprocating engine).

Touchdown should be accomplished on the main mounts, with the nosewheel 6 to 10 inches above the runway. Fly the nosewheel to the deck, don't slam it down or drop it by releasing back pressure on the yoke.

When all three wheels are on the runway, the copilot will, upon command of the pilot, hold the yoke slightly forward of center position while the pilot mans the nose steering, brakes, rudders, and reverses the props (if applicable).

When reversing propellers, determine positive reverse prop action on both engines before applying any appreciable amount of power. Should the reversing mechanism of one prop fail to actuate and high power is applied, an extreme turning moment is experienced due to one prop reversing and the other exerting forward thrust with manifold pressure supplied by the reverse thrust throttles.

The large rudder area of the P2V provides excellent directional control during most of the rollout—a fact too frequently overlooked by pilots experienced only in use of reverse thrust and/or brakes.

It is suggested that reverse thrust be used on all full-stop landings in P2Vs equipped with reversible propellers. Reverse thrust being most effective at high speeds, it is desirable to apply this force as soon as practicable after touchdown, *when the nosewheel is on the runway.* Generally, 1500-1700 rpm adequately stops the airplane on the average runway. Hold this power setting until slowed to about 50 knots, then un-reverse. Apply brakes when required. Caution: Never apply reverse thrust *before* the nosewheel is on the runway! Reversing with the nose high will cause dragging of the tail skag; reversing with the nosewheel almost on the deck will cause it to be *slammed* down.

Also, it is inadvisable to reverse on a snow covered runway since the reverse thrust will throw up a screen of snow that obliterates the pilot's vision. (If it is absolutely necessary to reverse due to a short runway, limit the reverse RPM setting to 1000-1200 so that visibility is not obscured.)

Waveoff

In order to assure satisfactory go-around performance, keep the airplane in trim throughout the approach. Excessive varicam on final can aggravate pitch-up when normal rated power is applied and flaps are retracted.

The magnitude of this pitch can vary from slight to severe depending upon the amount of varicam cranked in. With full varicam, the pitch-up will be uncontrollable if the flaps are retracted before retrimming the elevators.

At the initiation of a waveoff, retrim the varicam as power is applied. When it is assured that the aircraft will not contact the runway, retract the gear. After gear is retracted, raise flaps to 20-degrees, retrimming simultaneously. Raise flaps to 10 degrees keeping the airplane in trim and continue acceleration to climb airspeed.

In the normal CG range, a P2V can be flown in straight and level flight at 120 knots or less with full UP varicam and full flaps. Remember that at low airspeeds, full flaps cause nose-heaviness. Any reduction of flap setting, without a reduction in UP varicam, will cause tail-heaviness.

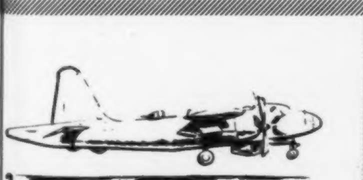
The Wright brothers found it necessary to use a lot of body english to aid in the trimming of their aeroplane. We have it easy—just press that little button in the right direction.

Touch-And-Go Landings*

Touch-and-go landings are made the same as normal landings up to the time the wheels are on the runway. As the wheels touch down, the copilot will, when directed, put the flaps up to 10 degrees, center the varicam and indicate to the pilot that everything is ready for takeoff. The pilot will then apply takeoff manifold pressure.

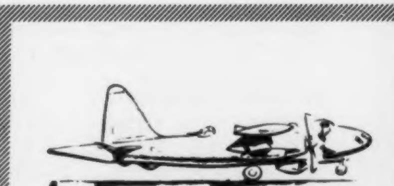
Before the installation of ASC 573 which pro-

*Please see special note, page 17



2 KEEP HER FLAT

3 APPLY POWER AND HOLD HER OFF



4 AND MAKE THE SKIPPER VERY, VERY HAPPY

vided the copilot with a varicam control on his yoke, it had been a practice for the plane captain to center the varicam with the switch installation on the pilot's pedestal. This was at best a poor arrangement since it required the plane captain to quit his ditching/landing station and brought an extra person into the cockpit during a period of increased activity.

The takeoff from a touch-and-go landing is normally made with 2600 rpm, but full low pitch may be applied in an emergency situation.

A recent instruction in some commands requires an intercom report from an after-station watch that both flaps have retracted to the 10-degree setting before power is applied. This is to prevent the possibility of split flap configuration should one flap retracting mechanism fail.

Standardized Procedures

Due to the increased pilot activity and concentration during the landing, it is imperative that rigidly standarized procedures be followed by all crewmembers—particularly by the pilot and copilot.

During the checkout phase of new pilots, procedures must be learned in such a manner and sequence that the pilot knows exactly the response he can expect from standard instructions given to the copilot, and the copilot can readily understand the instructions the pilot gives.

There is a ditching landing station with safety belt assigned for each crewmember of the aircraft, and the pilot should require the crew to be in their stations, belts fastened! If flight discipline is relaxed, it will usually be first apparent by the plane captain taking an unauthorized, unsafe position between the pilot and copilot to "watch" the landing.

Landing With A Feathered Prop

In 1953, prior to the installation of jet pods, BuAer asked Lockheed to conduct a demonstration tour to all domestic and to most foreign P2V bases. Over 100 feathered prop landings were executed without incident during this tour.

Landing with a feathered prop is not a serious matter providing a normal traffic pattern is flown. It is imperative to use exactly the same procedures and maintain the same altitudes and speeds used in a normal two-engine approach.

Case histories reveal that in all the accidents or incidents which occurred on landing with one prop feathered, the airplane overshot the runway in some degree. This, of course, is caused by the normal pilot reaction of approaching too high and too fast. In addition, there is the obvious absence of air braking from the feathered (vice windmilling) propeller, and there is added lift being developed by the wing (smooth, uninterrupted air flowing over it). The combination of these forces cause the airplane to float unexpectedly on the landing. Add excess speed and altitude and the problem becomes critical.

Neptune driver Jay Beasley has been flying for 25 Years, from OX-5 barnstorming days to ferrying for the Army Air Corps, airline and corporation flying. He's been flight-testing P2Vs with Lockheed since 1951 and as part of the program to provide operational assistance for fleet pilots has checked out and made demonstration flights for more than 2000 Navy pilots.

With the present jet engine equipped airplanes, it is recommended that the jets be used for single "recip" engine landings. The added safety factor of being able to waveoff at any time should eliminate the tendency for the pilot to approach too high and too fast.

A good procedure is to use 60-65 percent jet power on the side of the good engine and use the opposite jet to the extent that no rudder trim is required. This usually requires about 85 percent at 140 knots. When power reductions are required on the engine, adjust the jet accordingly. Both jets should be at 60-65 percent across the fence and secured soon after touchdown to preclude the residual thrust from carrying the rollout too far down the runway.

The secret of determining the exact point of touchdown is to use power on the reciprocating engine to maintain airspeed on final approach. When the power is reduced from this setting, the

NASC COMMENT: The Naval Aviation Safety Center, on reviewing recent P2V landing/takeoff/waveoff accidents, recommends the discontinuance of touch-and-go landings in the P2V. An inherent inadequacy of the touch-and-go is that it neither provides the complete training experience of a full stop landing nor the initial control of a takeoff. Further, the rapid transition from landing to takeoff situation does not permit positive completion of the checkoff list by either pilot; it requires an undesirable rush in retrimming of the varicam and repositioning of the flaps, and it eliminates the opportunity for proper power plant check.

airplane will land without floating. This, of course, is identical to the technique used in short field landings, except that power control should not be used excessively if possible.

Single-Engine Rollout

Immediately upon touching down, allow the nosewheel to contact the runway and use reverse pitch on the operating engine. Make sure the propeller goes into reverse before pulling any appreciable amount of power. The nose of the airplane will start to swerve in the direction of the reversed propeller. This can be offset by the use of full opposite rudder. Hold full opposite rudder and adjust reverse power to steer the airplane down the runway with the nosewheel and differential braking.

As the airspeed is reduced, reverse thrust and rudder effectiveness diminish somewhat proportionately. Nose steering is usually unnecessary until a speed of about 50 knots is reached.

The use of opposite brake at high ground speed with single-engine reverse may result in a blown out tire. This is caused by the pilot's inability to realize how much brake is being used to counteract the unknown effect of unsymmetrical reverse thrust.

Should it be necessary to execute a crosswind landing, always choose a runway so that the good engine is downwind. Reversing the downwind propeller will offset the weathercocking tendencies caused by the crosswind component.

Porpoise on Landing

When a landing is made nosewheel-first, porpoising action of the airplane may be induced for several reasons (usually, too high an airspeed).

Unless the pilot makes the proper corrections, the porpoising is apt to increase in magnitude to the point of damaging the landing gear. This holds true for most airplanes with tricycle gears.

When contact is made on the nosewheel, the nose is deflected upward, since the CG is far aft of the nose gear. Compression and subsequent extension of the shock strut further influences this deflection.

In addition, reaction timing by the pilot may cause him to apply UP-elevator simultaneously or just after the impact. At this point the airplane may be in a nose-high attitude, which the pilot will normally correct with some degree of DOWN-elevator.

Since airspeed has been lost by contact with the ground, and because of the nose-high attitude, an abrupt decrease in angle of attack will generally cause the nose to fall through and again contact the ground, even though corrective UP-elevator is applied prior to impact.

The subsequent porpoising cycles may become greater in magnitude as airspeed and elevator effectiveness diminish.

The only sure corrective action for this predicament is to apply enough power to hold the airplane off the ground with UP-elevator until sufficient control is regained to touch down on the main wheels, or if elected, to take a waveoff.

If power is added and corrective control action is taken after the first impact on the nosewheel, porpoising can always be prevented.

Common Landing Errors

The common landing errors are:

1) flareout too high
2) use of brakes and/or reverse pitch prior to nosewheel runway contact
3) letting the nosewheel down too hard instead of flying it down
4) insufficient varicam (nose-up) prior to reducing power during flareout
5) landing too slow
6) making long low approaches

Good landings, like good pilots, never make the headlines. ●

BREEZY POINT

The following is a pilot's verbatim report of conditions experienced aboard a carrier presently deployed. The pilot reported the conditions in an informal letter to the squadron.

"The weather has been poor for helicopters almost daily; 40-knot winds are the rule for landing. Today—I made a trip to the USS—— (carrier) and refused to land. They had 40 knots of wind from 315 degrees relative. The deck spot gave me a hole in the center of the deck ringed with planes. The turbulence was so great I almost lost control at 30 feet above the deck.

Also, today—Ensign ——— was on deck with 45 knots of wind. As the tie-downs were being removed, he started to overturn and added power to prevent it. The starboard tie-down was still attached. He made a 270-degree right turn around the tie-down and fortunately it parted and he became successfully airborne."

Please see "Dear Skipper", letter page 31—Headmouse.

BANANA PEEL

Anymouse was making a landing in an OE-1 (what big plane drivers refer to as a "powered glider," that is, until they try to herd one around in the blue) with a 30-degree crosswind from the left. During the rollout the aircraft started swerving to the left.

"I immediately applied right rudder to stop the swerve," said Anymouse, "and as this did not completely stop the swerve I also applied a small amount of right brake. As I did so, my foot slipped off the brake pedal and was caught between the brake pedal and the right side of the fuselage.

"I couldn't extract my foot and I couldn't apply either brake or rudder. The plane continued its swerve to the left and nearly groundlooped when I finally got my left foot over to the right side of the aircraft and applied all the right brake I could get.

"The plane came to a stop just off to the left side of the runway and had turned about 80 degrees to the runway and it suffered no damage.

"Reason for this fiasco is the small 'dog ears' on each side of the rudder pedals, which are supposed to keep a pilot's foot from slipping off the pedal, were bent so badly that they just didn't do the job. The dog ear on the right side of the right rudder pedal was bent about 30 degrees down from where it should have been.

"I recommend that all pilots in VMO squadrons be made aware of the possibility of this occurrence. I shall most certainly check it in the future before flying."

LOOK OUT BELOW

Anymouse was giving the pilot in the left seat of an AJ-2P a safe-for-solo check. They were using runway 19 which has a busy highway running at right angles to the approach end. Only 4000 feet is

available and an aircraft on final approach must cross the highway at a very low altitude.

"I was sitting in the photo-navigator's seat," said Anymouse, "and prior to passing over the highway I noted two automobiles pass in front of the plane. While mentally cussing them for cutting it so close I saw a third car start across.

"I had time only to warn the pilot 'Watch the car!' when we passed directly over him and landed. It was so close that, even though I did not hear or feel a collision, I made the pilot stop the plane while I examined it for signs of damage. There was none, but I know we didn't miss that car by more than five feet.

"In the landing rollout I called the tower to determine if the warning stop lights to halt traffic on the road had been turned on for our approach. They answered in the affirmative.

"Widely publicized disciplinary action for people who run those lights might be instrumental in putting a stop to the practice. The problem is in identifying the culprit in the first place."

HABIT TROUBLE

"Returning from my second hop in the F9F-8, I entered the break with 1200 pounds of fuel remaining. The wind was light and variable. My approach was slightly fast, and the aircraft touched down at 130 knots about 500 feet from the end of the 6000-foot runway.

"I held the nose off to utilize aerodynamic braking until the airspeed dropped to 90 knots. When I lowered the nosewheel to the

deck, I saw the bitter end of the runway less than 2000 feet ahead. I began emergency pumping of the brakes.

"The starboard tire blew at about 10 knots and the plane stopped 15 feet from the end of the runway. I did not use the emergency brake air bottle.

"I had formed a habit pattern for another runway which was 2000 feet longer. In the future, I will never delay braking unless certain of sufficient stopping distance."

HUNG TOW

"Making a hung-tow landing on a 6000-foot runway in an F9F-5 the tower instructed me to take the cut about 1000 feet down the duty runway. I took the cut, hacked power at between 120 to 125 knots and nosed over; my plan was to fly it down to the deck with the tow banner streaming behind so that it would hit the approach end of the runway at the same time as I touched down.

"However, the tow dropped fast and dug into the beach short of the end of the runway and caused me to lose about 15 to 20 knots and I stalled my right wing. Still nosed over, I picked up the wing and also the gliding characteristics of a bomb. Needless to say, I hit hard, slightly starboard gear low and put 10.5 positive G on the aircraft.

"There was no damage.

"As my primary job at this base was towing banners, I came up with, and practiced a new method of landing with a tow banner.

"If unable to release I would climb to about 1500 feet over the terrain which offers the most favorable approach to the runway and have gear and flaps down, sightly wide at the 180 position. In the meantime, I would notify the tower of my intentions and have them send someone out to the end of the runway to talk me in and also check the tow height over the deck as I made the nose-down approach at about 140 knots. I would land long, fly it with power on down to the deck, and pick up a tailhook cable or barrier if necessary.

"This method was used on two occasions successfully and the Davis barrier was not used on a 6000-foot runway."

(More next page)

anymouse

and his hairy tales

anymouse

Continued

TEN SECOND MAN

"Pre-flighted my AD-6 in 10 seconds flat and noticed that the plane was still tied down but would tell plane captain to untie it while I strapped myself in.

"While taxiing out gave controls 'unlocked' check and found rudder would not move. Realized trouble and taxied back to the line and had batten removed.

"Redfaced recommendation: Don't never climb in until the plane is ready to climb out."

FAST CLIMBOUT

"While on a night practice GCA pass I was cleared to descend to 1400 feet. Upon reaching that altitude, I noticed my radar altimeter was reading 200 feet, descending. After a scramble in the cockpit, full power was added.

"GCA was called to verify clearance and he informed us the clearance should have been to 2400 feet. Initial altitude was 2500 feet; I had repeated and written down the clearance as 1400 feet.

"During future GCAs I will be thoroughly familiar with terrain and GCA pattern. Also, will have GCA verify any irregular clearances before I comply with them."

FIRST TIME

"I was a student pilot on transitional training period in the S2F and was making touch-and-go landings with one of the station's best pilots. On our fourth approach something happened that I believed couldn't happen in a twin-engined aircraft.

"I was making the approach and landing with the instructor following through. I flared out for landing and was floating down the runway when an alert fellow in the tower called, '154', your wheels are not down!

"General quarters went on in the cockpit and, fortunately, the plane had ample power to pull us up from what could have been a serious accident. How we both forgot to check the wheels I cannot answer.

"We personally thanked the alert tower operator and presented him with a fine gift. Incidentally, neither I nor my instructor copilot have ever, until now, made a wheels-up approach."

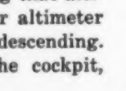
OVERHEARD ON AN INTERCOM

"I don't know where we are, but boy, we're sure making good time."

NO COMMENT

During a climbout through a low stratus deck in an AD-5 Anymouse became disoriented. The climbout had been straight out from the duty runway and he broke out of the clouds at 300 feet going down the runway at high speed in the opposite direction.

His trouble was that he was not scanning his instruments and was looking at his radio magnetic indicator instead of G-2 compass. The RMI does not work on inverter number one, which he used for takeoff. Anymouse was subjected to further instrument training almost too late.



OVER,

Following his fourth (mirror) carqual landing in an F4D-1, the pilot experienced an apparent brake failure as he taxied forward. Unable to answer the plane director's signals, the pilot could not correct a veer to the starboard side, where the plane fell into the catwalk. The aircraft hesitated for a few seconds (during which the pilot rechecked the oxygen to be on 100%) and then fell into the water inverted.

The impact was "extremely hard" and the pilot was momentarily stunned. The glass canopy of the F4D shattered upon impact and water immediately filled the cockpit. The pilot's first action ("just to be doing *something*") was to unlock the manual canopy release, after which he reached the face curtain with no difficulty and fired the ejection seat.

The pilot does not recall any excessive force of the ejection, and is confident that the automatic lap belt release functioned normally with no effort on his part. He first attempted to get rid of his seat "as if I were sitting in it," but being unsuccessful, was then able to roll out of the seat. In the total darkness, he wondered which way to swim, but "nature took care of this," and he was carried to the surface by the buoyancy of his parachute pack. During his underwater journey, the pilot passed through the turbulence of the ship's wake to emerge approximately 1000 feet astern, where he was promptly picked up by the helicopter.

an APPROACH special

UNDER, and OUT!

The Navy's first example of a successful underwater ejection occurred in March of this year. Anticipating the high degree of interest in this unusual accident, *Approach* presents a special account of the instance, obtained from the advance Aircraft Accident Report and from a telephone conversation with the pilot involved.

The F4D-1 aircraft sinks nose-first in shadow of starboard elevator.

The helicopter pilot observed the large bubble made by the ejection charge, and timed the ensuing period until the pilot's appearance as being of 45 seconds duration. (Pilot's estimate: "About three weeks"). The pilot's injuries included bruises and small skin abrasions, the latter probably caused by the shattering glass of the canopy. He has since returned to normal flying status.

Frogmen and engineers at Douglas conducted a series of design tests in a 24-foot water tank to assure that canopies on ditched F4D and A4D aircraft would jettison underwater. Tests proved the system successful in both upright and inverted positions, making possible the first such pilot escape.

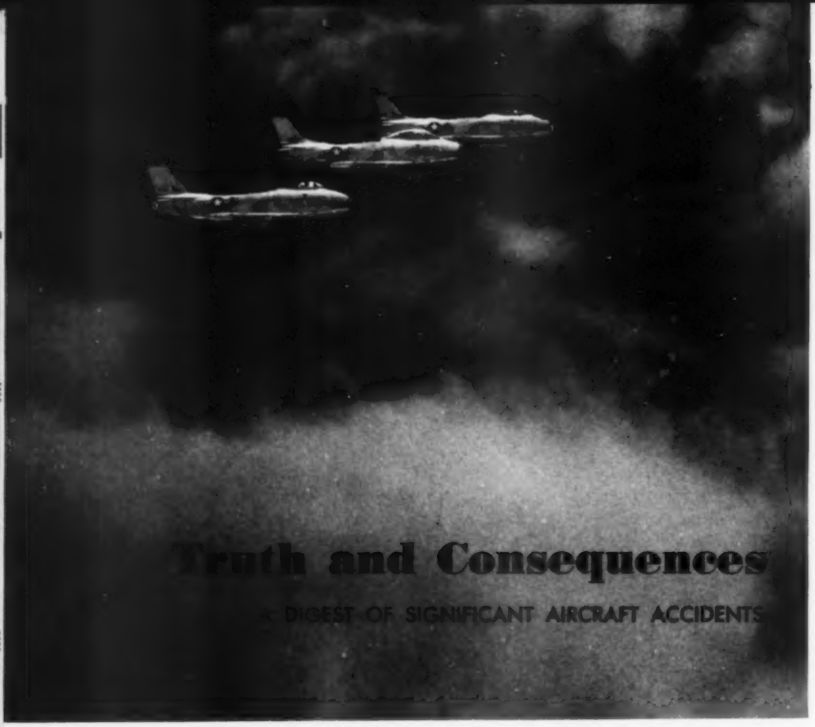
The rapid pickup by the helicopter made it unnecessary for the pilot to inflate his mae west, and although he found his waterlogged gloves (correct size not available for issue to him) an impediment to releasing his parachute harness, he was retrieved with harness and parachute intact.

(*In the light of other accident information, it is considered that the possible deployment and fouling of the chute during retrieving makes this procedure undesirable.*—Ed.)

The pilot's helmet and mask (with a MC-3 connector) remained on and the pilot recalls no difficulty in breathing prior to ejection, or in holding his breath after ejection. He was conscious of some ear pressure, which he relieved on surfacing.

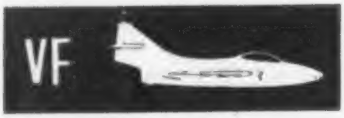
Queried about his previously stated conviction to eject in just such a situation, the pilot observed that this idea resulted partially from his misconception that the manufacturer had tested both canopy and ejection seat to a depth of 50 feet. (*Approach* is informed by Douglas that the canopy was successfully tested to a depth of 15 feet. DAC adds the opinion that the fact that the canopy glass broke on impact or that the cockpit was punctured apparently was the reason the canopy separated from the aircraft and pulled the safety firing pin of the Type I catapult.

(Approach *is advised that a forthcoming cockpit valve will permit rapid water entry to equalize pressure and facilitate canopy jettisoning. Further evidence of the interest in this phase of overwater operations is noted in continuing research, by the Naval Air Development Center at Philadelphia and at Key West, and by at least two aircraft manufacturers, Douglas and Lockheed. As further info is obtained,* Approach *will pass it on.—Ed.*)



Truth and Consequences

A DIGEST OF SIGNIFICANT AIRCRAFT ACCIDENTS



ALTERNATE EGO—Three FJ-2s, heading for a Carribean air station, had picked up a 70-knot tailwind at 34,000 feet and were on the good side of their fuel plan. Ten minutes from landfall the flight leader attempted without success to contact an air force base located on the northwest coast of the destination island.

Forecast weather for his destination, on the east coast of the island, had been for a broken deck, variable to overcast at 8000 feet with visibility 8 miles. Several minutes later he overheard transmissions from a civil field on the north side of the island which tended to indicate an IFR stack in progress.

Just before crossing the coastline the flight leader spotted the air force base through scattered clouds. From this fix only 90 miles remained to fly to the destination. After some difficulty the leader contacted the air station tower and was informed that present weather was 900 scattered, 3000 broken and 10,000 overcast with 10 miles visibility. As the cloud tops were at an estimated 30,000 feet he requested a GCI/GCA letdown and approach. He was given a channel for GCI but told that GCA was not set up.

Only after the entire flight squawked IFF did the GCI station believe they had the aircraft on their scope, some 75 miles distant. Next the flight leader was unable to receive the air station homer on his ADF and he then tuned in a commercial broadcast station located five miles north of the field. Finally, GCI lost the flight in ground return when they were about 25 miles out. The leader again requested present weather and was given the same sequence report as before.

Considering flight hours the wingmen were relatively inexperienced. The number 2 man had 479 total hours with only 57 in model and 3.6 instrument hours in model in the last three months. The leader had about 2400 hours including 785 in jets and 300 in the FJ.

Assume for the moment that you are the flight leader, You must decide what course of action will get your flight down safely. In attempting a letdown at your destination with two inexperienced wingmen, you reflect that GCI is ineffective, the homer apparently not operating, GCA reported unable to assist and one wingman says his birddog is out. Because a front had moved across the island several hours earlier, the runways are probably still wet. The field is clear but you are landing at a strange field. You know it has 6000-foot runways and those scattered 900-foot clouds may mask the hilly (1000 feet) terrain near the field.

Where else to go? The civilian field is out; it sounds as if they are IFR. Your alternate is the air force base and you know it's clear. With 1500 pounds you've got plenty of fuel to get there, even bucking a 70 knot headwind.

Decided yet what you would do if you were the flight leader? Keep it in mind as the story continues.

Several minutes after he estimated passing his destina-

tion the flight leader spotted a large hole in the cloud deck and recognized the land below as part of an island just to the east of the air station. He called GCI and told them he was letting down VFR.

The aircraft were under the overcast at 5000 feet, south of the field. It was not immediately visible and the flight leader asked if it was raining at the field. He was told "negative" and shortly after tracking north toward the broadcast station the field came in sight.

Rain showers were sighted moving toward the field from the southwest and the tower advised that the runways were wet and slippery. Arresting gear was available and the flight leader instructed his wingmen to use it. To expedite the landing a breakup was made on the downwind leg. At this point the leader told his wingmen to remain VFR and if they could not to head east to the island previously sighted and land at an outlying field there. Insufficient fuel remained to go to the air force alternate.

The leader landed successfully in light rain with an estimated visibility of one and a half miles. His wingmen did not do as well. The number 2 man swung around into the break and went slightly wide and entered an "extremely dense waterfall of rain."

"I went on instruments," he said, "continued turning and broke out shortly. I then noticed the ground about 200 feet below me. Checking my altimeter I noticed I had 1000 feet and realized it was the high ground I was briefed about.

"As I again approached the 180-degree position I could not see the runway because the hard rain had moved over the field. Seconds later I entered the rain again and had no forward visibility. I could only see a couple of hundred feet out of the side. I dropped speed brakes, gear, flaps and hook and turned toward the runway, hoping to be able to see it as I got closer.

"At about the 45-degree position I could faintly make out the hangar and right edge of the runway. I saw I was high for a normal approach but knew the arresting gear would stop me. I didn't want to take a waveoff as long as I had a chance to land because I didn't think I could find the field again. I pulled the throttle back and nosed over. As I approached the deck I flared out. I knew I must have been over the runway but couldn't judge my altitude. At this time I saw the edge of the runway and saw the gear go by. Realizing I couldn't make it I added power, closed speedbrakes and raised my gear."

A witness near the runway arresting gear also noted that the landing flaps were retracted and the aircraft assumed a nose-high attitude. It settled on the runway about 1000 feet from the end, slid off the side and came to rest 200 feet past the end of the runway in heavy grass and small trees. There was no fire and the pilot was uninjured.

The number 3 man didn't fare much better. Two minutes later he made an approach when the rain shower had cleared the field, touched down near the end of the runway, and rolled straight ahead down the center without appearing to lose any speed. As the aircraft passed the arresting gear the hook was seen to be in a half-cocked position about six inches off the runway. It ran off the end of the runway, according to a witness, at approximately the same speed as the touchdown speed. There was no fire and the pilot was uninjured.

During the inevitable reckoning which follows a situation like this, several discrepancies were found which might have affected the flight leader's decision to take his flight down VFR. The weather at the field had deteriorated rapidly just prior to the accident. All squadron flight operations had been cancelled about 15 minutes prior to the arrival of the flight over the field because of the large rainstorms hanging over the mountains in the immediate vicinity. This weather advisory was never passed on to the flight leader. Weather to the south and east was clear with only scattered clouds.

Contrary to the information received by the flight leader concerning GCA, it was manned and available for use. No homer was in operation and the action of the pilot using a broadcast station is to his credit.

Although the number 2 man's accident was classed as pilot error the flight leader took part of the blame. An endorsement on the accident report noted that "general prudence should have dictated a return to the air force base which was known to be in the clear. . . . After penetrating and estimating the visibility to be one and a half miles in

More briefs next page

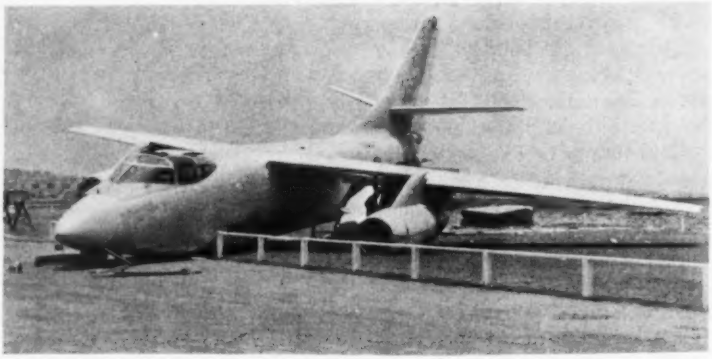
rain on his approach he should have ordered the flight to proceed . . . eastward to the outlying field."

Another endorsement said, "it is incumbent upon all flight leaders to constantly consider fully the experience and capabilities, and problems, of their wingmen. What possibly seemed fairly simple to this flight leader . . . was anything but simple to his two wingmen."

This is probably good for some free philosophy to the effect that if the guys had made it safely, it would have been just another of those narrow squeaks every aviator experiences. It's a case of—if you don't make it you goofed!

Moral: Can you afford to take a chance? And if not, can you afford the nickname 'Grandma'? It appears to us that maybe it's up to the skipper and flight leaders to lead in promoting a policy of not criticizing a pilot for going to his alternate, especially in jets.—Ed.

VAH



Admittedly this pilot was on his second A3D solo hop, but nonetheless his reported actions demonstrate the critical importance of a correct approach to touchdown in high performance aircraft and the need for proper timing in the use of all braking aids.

RUNAWAY—After two hours flight, the pilot of an A3D check in over his base for landing and was given the wind as SSW at 10 knots. Two runways were available. Runway 18 was most nearly aligned with the wind and was 6000 feet long. Runway 29 would give a 90-degree crosswind but was 7500 feet in length.

The pilot was on his second solo and had 14 touch-and-go landings plus three full-stop landings in the A3D. He had a total of 4400 hours but was comparatively new to jets; having 91 total jet hours of which 14 were in the A3D.

Problems associated with landing the plane on the 6000-foot runway had been discussed at pilot meetings and as a result of these, a squadron policy was established to land on the 7500-foot runway except when crosswinds of 90 degrees in excess of 15 knots existed. The pilot elected to use the 6000-foot duty runway however, and waved off on his first approach due to traffic.

On his second approach the bombardier/navigator computed the approach speed at 128 knots and both he and the pilot stated the approach speed was 126 knots on final.

Touchdown was made in a flat attitude about 250 feet from the approach end but according to pilot-witnesses the aircraft became slightly airborne with . . . "the main mounts suspended about 12 inches off the deck . . . perfectly balanced on its nose gear."

It continued down the runway in a nose-low attitude for some 1500 to 3000 feet before settling firmly on the main mounts.

The Hytrol switch was on and the aircraft began to decelerate as brakes were applied. A pilot observing the landing transmitted "He'll never make it!" Immediately after this the third crewman shouted "Pop the chute."

The drogue chute was released and then the arresting hook was lowered. However the plane was approaching the arresting wires, 1400 feet from the runway end, and it passed without engagement. At between 30 to 35 knots the A3D went off the runway and

the bombardier moved the throttles to OFF.

After a run of 534 feet over an unimproved overrun the aircraft struck a small reinforced concrete structure and came to rest with the nose and port main mount partially torn off. There was no fire and no crew injury.

Examination about 30 minutes after the accident revealed the wheel brake housings still warm and readings on hydraulic air system gages normal. Tires were in good condition with no evidence of skidding. In later tests the hydraulic operation of the brakes was normal. Flaps had not been retracted after touchdown and no attempt was made to use the manual emergency hydraulic or pneumatic braking systems.

Included in the board's conclusions was the point that the minimum stopping distance of 4300 feet for the weight and wind conditions did not allow an inexperienced A3D pilot on his second solo flight a safety margin for stopping the airplane on the runway used. Other points were that the drogue chute was deployed too late to be effective and the arresting hook was lowered too late to engage the arresting gear.

The squadron syllabus was revised, following one of the recommendations, to provide for an experienced A3D pilot to accompany a newly qualified pilot on each of his first three solo flights, including the first night flight.

(For a discussion of factors involved in properly stopping your aircraft, please see "The Long and Short of It," next page.—Ed.)

wheels up SAVES

The Big PAYOFF

Box score on major wheels-up landing accidents (pilot-caused)

1 Jan.—4 May 1956	25
1 Jan.—4 May 1957	9

Nance, B., TD3 and Ashcraft, W. L., AO3 of VF-122, NAS Miramar, 14 December 1956

Nance, tower operator, and Ashcraft, runway watch, simultaneously gave a waveoff by means of radio and runway flares respectively, to an FJ approaching for a wheels-up landing.

PFC J. W. Collins, MCAS Miami, 28 December 1956

Standing duty as runway watch, Pfc Collins waved off an AD making a wheels-up approach by firing his Very's pistol ahead of the aircraft.

Lembke, A. H., AO3, and Garcia, R. A., AN, both VF-154, and Brown, J., AA, NAS Moffett Field, 12 December 1956

An AD was shooting night touch-and-go landings. On this particular approach—wheels-up, Lembke, in his position downwind of the runway, illuminated the underside of the aircraft with an Aldis lamp permitting Garcia, at the end of the runway, to observe the retracted landing gear and fire flares. Brown, further down the runway as a backup for Garcia, fired a second set of flares and the wheels-up landing was prevented.

Rynders, D. A., AA, NAAS Chase Field, 23 January 1957

Pilot of a TV-2 put gear handle part way down and reported "Gear down and locked." Rynders, on watch, observed plane in final with gear up; fired flares and made his third save.

SGT Victor Reyes-Matos, MCAS Miami, 1 November 1956

Sergeant Reyes-Matos, standing wheel watch duty at night, noted AD in final with approach light out; fired two flares down the runway and prevented a wheels-up landing.

Corporal R. W. Michau, Edenton, 15 November 1956

The aircraft concerned was No. 1 of a section. When it was turning base, Cpl Michau asked the pilot to check his gear. The pilot advised that his gear indicated down. Michau ordered a waveoff in the final when he observed that the gear was not down.

Corporal R. L. Frech, MCAS, Miami, 20 October 1956

Standing duty as he runway wheel watch, Cpl Frech observed an AD-6 making a wheels-up approach. He fired two red flares down the runway ahead of the aircraft: the pilot responded and took a waveoff.

Fischer, P. D., AA, Utron THREE, 1 November 1956

During night FCLP at NAAS Brown Field, Fischer illuminated an AD-5 as it passed his wheel-watch post with the gear retracted. He triggered the remote flare guns, alerting the pilot who immediately added power and departed the pattern.

A number of items affect the braking of your aircraft. Some of them can be changed by the pilot; some cannot. Though all of these factors are mentioned here, major emphasis is placed upon those about which the pilot can do something.

The first of the factors is the coefficient of friction, which may be defined as the measure of the relationship of the frictional force between a body and the surface on which it moves. It varies with:

Type runway
Aircraft speed
Tire tread pattern and material
Inflation pressure
Temperature
Condition of runway; ice, snow, rain

Type Runway

Runways are made from various materials, depending usually, upon the cheapest material available. Naturally, this material may vary from one installation to another.

Yet we cannot say that one type of material has a definite coefficient of friction, for it has been determined that a runway made of the same material throughout may vary in coefficient of friction from one *section* of the runway to another.

THE LONG AND

THE SHORT OF IT

We can say, however, that dry concrete and asphalt will run from about 0.5 to 0.85 coefficient of friction (as related to the theoretically possible 1.0.)

Aircraft Speed

Speed of the aircraft can be controlled by the pilot and will be discussed later.

Tire Tread Pattern

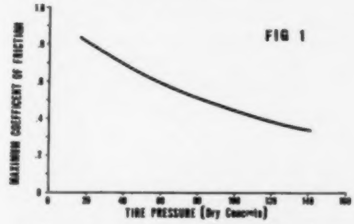
Tread material and pattern cannot be controlled by the pilot. He *can*, prior to takeoff, check to see how much tread he has. and he should know that on an icy or wet runway a smooth tire will not give him the braking that one with a good tread will.

Aircraft tread design is a compromise between the best tread design and a design that will stand up under the high speeds necessary in modern aircraft.

Tire Pressure

Inflation pressure can be varied very little. While the carrier aircraft will generally have a high pressure tire, multi-engine aircraft tend to use lower pressure, and, of course, lighter aircraft generally have lower pressure tires.

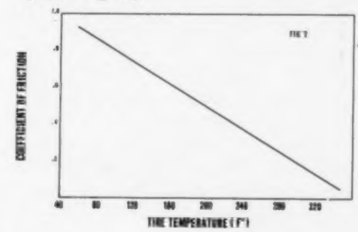
In most cases, the lower the tire pressure the greater the friction generated between the runway and the aircraft as noted in Fig. 1. The exception is a runway with water on it.



Here the high pressure tire tends to give better braking, since there is less contact area to cut through the water to contact the runway surface. (See "condition of runway", Fig. 3.)

Temperature

The higher the temperature, the worse the braking action. (See Fig. 2)



Condition of Runway

The condition of the runway causes wide variations in the coefficient of friction. Snow, ice, and rain cause most of these variations.

Water on the runway can be the cause of an almost complete loss of friction when the "cushion" of water causes the tires to

FIG. 3 Condition of Runway

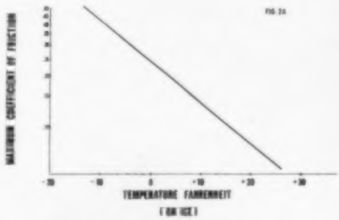
Dry asphalt and concrete	.5 to .85 C of F
Snow (that has not been exposed to temperatures above about 25°F)	.25 to .35 C of F
Snow (that is just below the freezing point and exposed to the sun)	.2 to .25 C of F
Rain or slush on snow or ice	.075 to .2 C of F
Frost changing to just above freezing	.075 to .2 C of F

Please turn page

act as hydroskis.

Ice, itself, furnishes a good coefficient of friction. Surprisingly enough, it is about equal to dry concrete or asphalt.

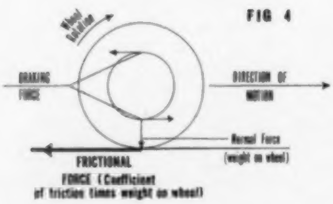
However, ice causes trouble when it is heated to its thawing point (as from tire friction). As soon as the tires heat the ice, the thawing furnishes a thin



layer of water for the tire to skid on, and the necessary braking friction is lost.

Braking force is equal to the coefficient of friction times the weight on the wheels.

The retraction of flaps on touchdown increases the weight on tires which, in turn, increases



A funtional diagram records the many elements making up the braking problem.

Whether the tires blow from a hard landing or excessive braking, these lapses of pilot approach and braking technique put him in a corner.

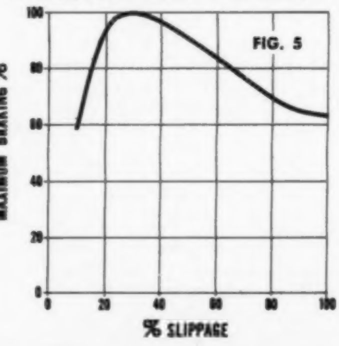
wheel braking effectiveness.

Tests conducted by Goodyear Aircraft Company showed that for an F-84G on dry concrete, with 80% braking efficiency, flap retraction reduced landing roll by 10%. On an icy runway, with 100% braking efficiency, it increased the landing roll by 6%.

While aerodynamic braking is independent of runway conditions, wheel braking is, of course, limited by tire-to-runway friction.

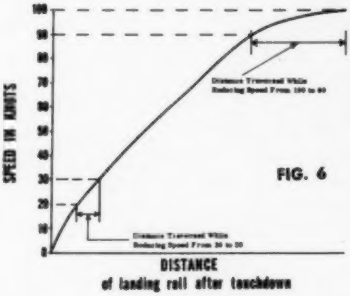
A Little Slippage Helps

Maximum braking is obtained with 15 to 25 percent slippage. If the aircraft is making 100 knots and the outside circumference of the tire is doing 75 to 85 knots, the maximum braking is obtained. More than 15-25% of slippage results in skidding.



This diagram shows the changing effectiveness of braking vs wheel slippage. A certain percentage of wheel slip is necessary for maximum braking efficiency.

The following diagram shows a time-distance relationship in the landing roll.



Compare the distance covered in decelerating from 100 to 90 knots and from 30 to 20 knots, each being a loss of 10 knots.

From this, it is easily seen that for a short landing roll, early braking is important.

Once on the deck the aerodynamic braking by the flaps could be outweighed by the reduction of weight on the wheels.

Skid Row

Skidding is inefficient. In the skid the rubber on the tire can melt, giving the tire (or most of it) a liquid surface to slide on. This reduces friction a great deal.

Even if the heat is not great enough to melt the rubber, small particles torn loose by the shearing action will act as rollers, again reducing the friction appreciably.

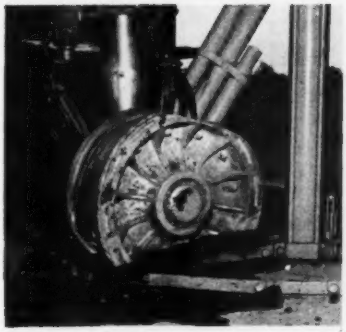
By looking at Figures 5 and 8, we can see that a skidding tire has a low braking efficiency.

The skid, then, is undesirable; however, that is not the worst part of the skidding tire.

Blowouts & Emergency Braking

Very little skid is necessary to blow the tire. After the tire blows, it disintegrates quickly, leaving you on the rims.

Metal sliding on concrete has an extremely low coefficient of friction. Therefore, for two reasons it is undesirable to skid: (1) the skid on rubber is inefficient; and (2) the skid on metal is even more inefficient.



When your braking system is working normally, use of the emergency braking system (if it is the type which locks the brakes) is the worst thing you can do. Here the brakes were locked, the tire blew, and only a nub remains.

If the emergency brake is the type which locks the wheel, and if the normal braking system is working, pulling the emergency brake then is one of the worst moves a pilot could make.

Aerodynamic Factors

NACA states that a reduction in landing roll results from the application of up elevator just after the nosewheel touches down.

The amount of up elevator is limited to keep from lifting the nose gear, but it transfers a maximum possible weight to the main gear. The savings on dry concrete were 25 percent of the landing roll; 30 percent was saved on wet concrete. But if you have a steerable nosewheel, elevator overcontrol can create another problem—and you may lose some directional controllability.

Deflection of ailerons is an effective source of drag—flaperons even more so.

Any additional aerodynamic drag will help. Opening of the canopy (not a clamshell type, please), cowl flaps, or bomb-bay doors will produce drag.

If the brakes are the type that will fade if used for some time in the landing roll, techniques must be determined for the particular aircraft involved in order to get the most from the brakes.

Get Her Down Boy

If for some reason stopping in the minimum distance on a particular pass is important, and if the aircraft arrives at the runway with more speed than is desired, then it is better (if you have a dry runway and good brakes) to put the aircraft on the deck even with excessive speed, using braking to help stop. The plane can be slowed to a stop more quickly after touchdown than by "floating" up the runway.

To reduce landing roll, touchdown speed is important. The slower the better—within safety limits. If full flaps are employed, a slower safe approach may be made.

The jet engine has residual thrust. When it is at idle, the thrust is enough to keep the aircraft rolling. The speed at which it will keep the aircraft moving depends, naturally, upon the type aircraft.

If the pilot desires to stop in the minimum distance possible, he must consider shutting down the engine upon touchdown. The items which might prevent his shutting down would be possible loss of hydraulic pressure for braking and nosewheel steering.

Steady or Intermittent?

Braking *technique* is of vital importance. This is the application to wheel braking of several factors we have covered. Figure 5 tells us that we want about 20 percent slippage.

The best way to get it is to have a black box give it to us—The A3D has it in its Hytrol antiskid system.

But most of us do not have the black box. We must decide whether or not we can come close

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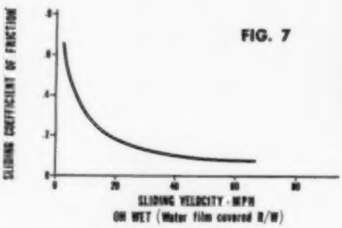
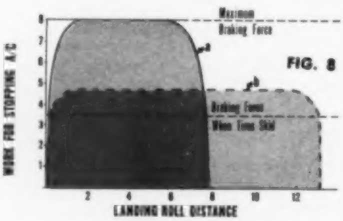
to 20 percent slippage by a steady or by an intermittent application of brakes. If a steady application is used, and a skid is produced,



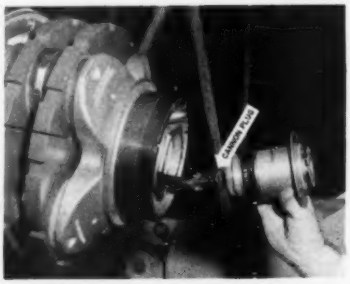
Figures 5 and 8 show that the braking will be poor, and other complications are possible.

Figure 8 shows braking work done to dissipate the kinetic energy of a landing airplane. In



these diagrams work other than wheel braking is ignored. The greater the number of pounds of force applied over a shorter length of time, the shorter the distance required to stop. The shaded area *a* and *b* represents this as work. *A* represents the ideal, that which is obtained, or nearly so, with the antiskid black box braking device.

With no black box, when the pilot applies pressure, trying for a steady braking force, there are infinite patterns that could be



It's just a handful, but this antiskid device is a real pilot's friend.

followed. Line *b* in Figure 8 is an example of one. The question is this: how near can a pilot come to line *a* without skid-

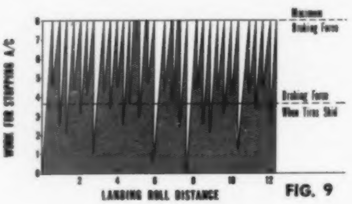


FIG. 9

ding?—remembering that if the skid develops the braking force again drops sharply. It drops even more if the skid produces a blown tire.

Figure 9 shows a pattern when quick hard applications of brake are made followed by rapid easing of the pressure. In this method there can be no more than a momentary skid of tires (which will not result in a blown tire) if that much. Each pilot and/or each command must decide which is the better for use in any specific landing situation. (Because of controversy over the two systems the diagrams were purposely made to cover the same landing distance and the units are arbitrary values.)

In considering how best to stop all aircraft, it is easy to see that no one system can be *the* system for stopping in the minimum distance. Each aircraft braking system, both wheel and aerodynamic, must be considered, as must the runway surface, the temperature, the altitude (for touchdown ground speed).

The normal landing will not be a minimum distance landing. The saving of brake pucks, tires, and other considerations will affect the techniques used to stop. It behooves all good aviators to *learn* the methods that will give the minimum distance ground roll.

If it is not feasible to conduct actual drills, then the good aviator will conduct frequent drills mentally, covering each step necessary to stop in minimum distance, the type aircraft he flies.

Material for this review of the braking problem was obtained from NACA, Army "Aviation Digest," Goodyear Aircraft Co., North American Aviation Inc., and the Flight Safety Foundation. ●

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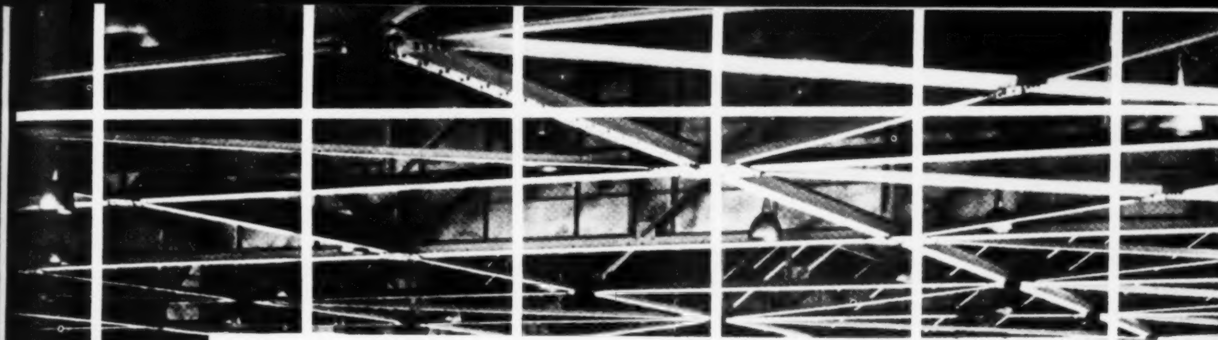
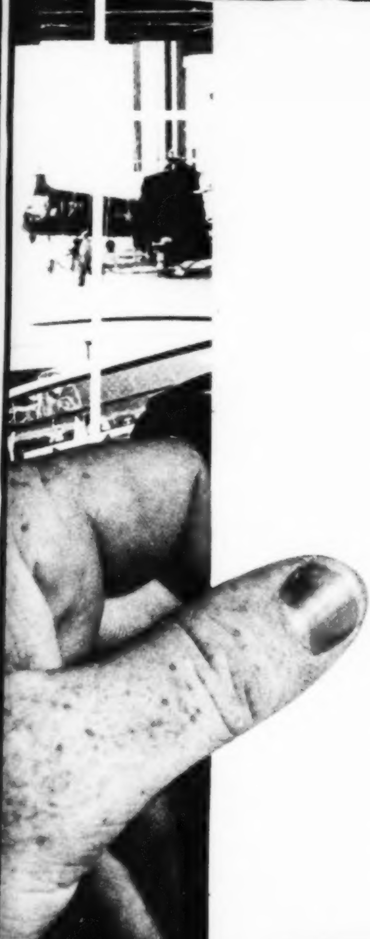




HELICOPTER UTILITY SQUADRON

DETACHMENT 3

1 June 1957

Dear Skipper:

First let me offer my congratulations on your new command--I was pleased to learn that my former squadron skipper was now CO of the carrier on which my helicopter detachment is to deploy. I'm equally glad of the opportunity you offered to express some thoughts about our forthcoming cruise.

As you said in your letter, if you don't know the whole story you can't get the job done properly. Well, I believe you will be interested in some of the information I've picked up about helicopter operations -- lots of them learned the hard way -- so here goes.

If you remember, we used to gripe considerably about the general lack of awareness on the part of the ship and/or staff with respect to our squadron problems.

Please turn page

Well, since then, the picture has improved in many respects, but recently I've been impressed by a similar lack of adequate helicopter operations knowledge on some of the ships (carriers and other types) from which I worked. I guess I was puzzled most by the fact that the majority of such troubles could have been avoided had the ship's people been more familiar with such information as contained in ComAirLant Instruction 3700.5A and ComAirLant Notice 3700 and ComAirPac Instruction 3710.1B.

While I've had some very fine helicopter cruises aboard ships, with excellent cooperation received on occasion, there have also been pretty rugged instances which demonstrate a definite need for improvement.

For example, there were missions such as being sent out at night, under an overcast, to pick up a man from a submarine -- which involved finding the sub by its masthead light and then being forced to fly backwards to hover because the sub was heading downwind at reduced speed.

Again, I've yet to make a cruise on a carrier where at some time or other, after landing, I haven't been directed to disengage the rotors "on the double." At such times the wind has been gusting around 20-30 knots over the bow from dead ahead. I usually speak up and tell them I can't disengage -- after all I have an airspeed indicator which measures the wind too -- but chances are I disengage after an argument.

That's when it seems that the folks at Pri-Fly don't seem to realize that there have been more blade-coning accidents aboard ship than any other type--and when those blades break, they fly like shrapnel. Usually after one such fiasco, there are several weeks in which people stay clear of the weather decks when I disengage in a high wind.

Of course there seems always to be the recurrent problem of contaminated fuel -- you'll remember that headache as one of long standing, and the helicopter people are perhaps even more conscious of the potential results inasmuch as we're supposed to rescue others and not be a subject of pickup ourselves.

Continuing my listing of "things I learned the hard way about helicopter shipboard operations," there must be added the old,

old situation of unhealthy overloads, wherein on a hot, humid day, for example, I can't seem to convince my passengers that somebody will have to wait if I'm to conform to BuAer gross weight limits. (Surely, I can boot 'em off, but there's an understandable reluctance to bump senior officers...)

Back on ships again, (this time the cruisers and battleships). We chopper drivers become rather unhappy when we're forced to leave the poor old rotor-floater out in the salt spray because the hangar space is filled with ship's boats.

That's the way the ball bounces, except that it should be pretty clear that the corrosion exposure is just going to require extra maintenance -- possibly cause unnecessary AOG time on the aircraft likely at times it may really be needed in commission.

That about ties up this lament, unless you consider such items as the blithe indifference often displayed by elevator operators who occasionally can't seem to resist dropping the elevator with the helicopter's blades unfolded--or the upsetting habit of ships to let their stack gas blow down on us sea taxi-drivers while we're picking up passengers on the fantail.

Hope this is the kind of briefing you wished -- I certainly intend to take you up on your suggestion to get together with the ship's ODs and air department personnel immediately on coming aboard. I've always learned considerable from each cruise, and maybe we can arrange to have everyone learn even more on this one.

Meantime, I'm looking forward to another fine cruise with you.

Very respectfully,

I. M. Rotorwing

LCDR I.M. ROTORWING
O-in-C Helo Detachment Three

notes from your flight surgeon

Tips from flight surgeon, survival and personal equipment officers.

UNSAFETY PINS

From a flight surgeon: . . ."The main purpose of safety pins in the ejection seat is to prevent inadvertent ejections while the aircraft is on the ground. There does not appear to be any useful purpose in retaining these pins in place when the plane is airborne. When time is of the utmost importance the failure to have previously removed a safety pin may prove to be a FATAL MISTAKE.

"I have interviewed a number of aviators who fly TV-2's with safety pin in place because of fear of inadvertent ejection."

LOST KNIFE

He who wears his knife attached to his life vest oral inflation tube is almost certain to lose said knife in ejection force, or bailout, and sometimes under ditching forces.

Many aviators find it convenient to wear the knife fastened to the leg just above the knee. Others prefer to carry it just below the knee. The actual position is a matter of individual choice, so long as the knife is in a good strong sheath, firmly attached to the outer garment and readily accessible in an emergency.

NO TIME FOR SAFETY?

Everybody does it. Civilian or military, autoists, pedestrians, housewives, handymen—apparently aviators are no different—everybody is too busy to be safe.

While cruising in an SNB-5 at 8000 feet, the pilot experienced complete loss of power on both engines simultaneously. The local terrain was mountainous with elevations up to 5935 in the vicinity. The local weather was solid overcast with tops up to 7000 feet, bases variable, 0 to 200 feet.

The pilot would have jumped, if he had been wearing his chute!

During the descent he made continuous, unsuccessful attempts to restart the engines, thus keeping his hands too occupied to be able to get to his shoulder harness. He asked the observer to put the straps over his shoulders, and was then able to fasten them. The observer had left his seat at the time of the emergency to get lifevests and secure loose gear. When he saw the ground coming up he had no time to return to his seat, but braced himself in a passenger seat, holding the shoulder harness tightly since there was no time left to fasten it.

The plane broke out of the overcast at 200 feet, facing a hill.

A sharp right bank avoided this obstacle, and the pilot made a full-stall wheels-up landing in a relatively clear area. The aircraft bounced several times and came to a full stop, still on a straight course from the first point of contact. Neither man was injured.

Without harness, if this had been an uncontrolled crash landing, or rough terrain, the failure to wear safety equipment would probably have been fatal.

HEART LINE

A HUP-2 helicopter rescued all three crewmen from the water shortly after an AJ (*Savage*) bomber was ditched just outside the mouth of Subic Bay, P.I.

The HUP picked up the men one at a time, taking three minutes to make the rescue, and headed back for Cubi Point, jam-packed.

This is believed to be the first time three men have been rescued from water at one time using a HUP-2.

The 'copter was diverted from another mission and had consumed fuel, lessening the weight and allowing all three men to be retrieved at once.

The AJ's cockpit flooded immediately upon hitting the water, but the crew managed to extricate themselves quickly.

The AJ remained afloat for 15 to 20 minutes before it sunk.

NOTHING BUT THE TRUTH

The high rates of fuel consumption in modern high performance aircraft demand that fuel quantity indicators provide accurate measurements of fuel on board. A modern Navy jet aircraft could require as much as 1000 pounds of fuel to effect a go-around and landing. A small error in fuel gage calibration here could cause the loss of an aircraft and crew.

Let's take the case involving a pilot who planned a flight of one hour's duration with a fuel load of 13,020 pounds of fuel on board.

Approximately one hour and ten minutes after takeoff, the pilot noted that the fuel gage indicated 10,000 pounds. He had been flying with the fuel quantity selector switch in the TOTAL position.

About the same time a fuel check was made and the fuel quantity gage was noted as being in error as follows:

(a) Fuel was indicated in the auxiliary tank. This aircraft did not have one installed.

(b) Wing tanks showed 7000 pounds, even though maximum wing quantity prior to takeoff was 2580 pounds and all or most of this had been dumped.

Please turn page

NOTHING BUT THE TRUTH

Continued

(c) The aft tank showed 4000 pounds.

(d) Total reading: 10,000 pounds.

After checking, the pilot concluded that the fuel quantity indicating system was not to be trusted. He had started making preparations for an immediate landing, when both engines flamed out at approximately 1500 feet with indicator indicating 4000 pounds in aft tank. The pilot then ordered the crew to bail out. Normal descents were made by two crewmen, the pilot failed to pull his chute release, and received fatal injuries.

Accurate measurement of fuel quantity in today's aircraft has been the subject of much engineering study. Various methods including actual weighing, the use of a float arrangement, and capacitor type sensing systems have been closely studied. As a result, the most accurate and reliable fuel gages presently in use depend on the capacitor principle. This principle utilizes a relationship of density and dielectric constant.

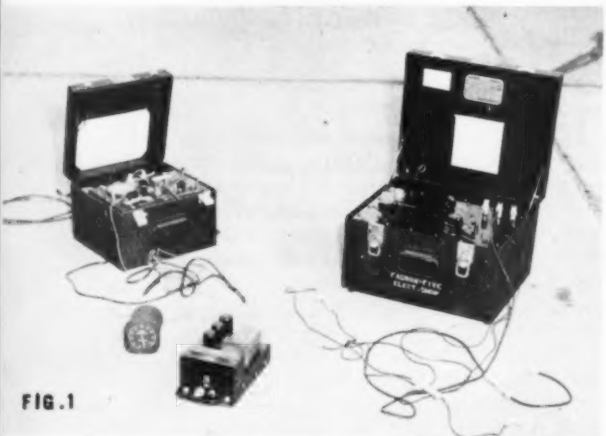


FIG.1

MD-2 Tester (left)
R88T0831-500-000
@Capacitor Fuel Quantity Gage Tank Unit Insulation Tester

Measures capacitance of tank units directly. Also incorporates low voltage megohmmeter for measuring insulation resistance of tank units and/or cables and connectors.
CAUTION: Observe Polarity.

MD-1 Tester (right)
R88T0960-025-000
@Field Variable Capacitance Tester

It is made up of two precision variable capacitors. Avoid jarring or dropping and keep in dry area. Should be recalibrated every six months.

For instance, most jet fuels have a dielectric constant of approximately two and a density of approximately six and a half pounds per gallon. This is slightly different for general aviation gasolines used in reciprocating engines. The capacitance fuel gage cannot indicate under all conditions whether or not a tank is full. It only indicates the fuel quantity by weight of fuel aboard.

Other factors that should be taken into account are ground attitude and temperature. There is no fixed FULL amount of fuel in any tank in terms of pounds, nor can accuracy of a fuel tank or of a fuel gaging system be determined by refueler meters. Meters on refuelers are not 100 percent accurate. Therefore, these readings cannot be considered as valid indications of actual fuel pumped in, even though the meters can be checked periodically and a certain amount of validity associated with them

The engineering involved in a fuel quantity system takes into account variables such as temperature and thus has an inherent controlled accuracy within the system. However, the accuracy of the system is no better than its calibration. A fuel quantity gage is designed to indicate fuel remaining on board an aircraft. In order to obtain the expected system performance, it is mandatory that the fuel quantity gaging system be properly calibrated.

Irregular fuel cell shapes and variations in fuel characteristics require the sensing tank units to be especially designed for a specific installation. The maintenance technician must understand the factors directly affecting fuel quantity measuring systems.

A basic fuel measuring system must contain some form of sensing unit that is located in the fuel tank, and also an indicator which will register the quantity of fuel. Electrical elements in the circuit include a tank unit, bridge circuit, amplifier section and indicator.

A change in fuel level causes an electrical unbalance in the tank unit which initiates a signal proportional to the change in fuel quantity. The signal is then routed to a bridge circuit which compares voltage phase relationships and routes the small voltage signal to the amplifier section. Here the voltage is amplified and the phase relation is maintained. This voltage is then applied to a two-phase motor which is geared to a fuel quantity pointer. The pointer goes upscale or downscale depending on the initial signal that began at the tank unit.

There are no moving parts in the tank unit. The fuel quantity system is a self-balancing system.

With the system energized, it is balanced when the pointer is not moving, unbalanced when the pointer is moving.

A fuel quantity indicator can be designed to have a linear dial face in which a given number of angular degrees represents the same fuel quantity in pounds at any part of the dial. A compensating feature may be employed to minimize the effects of variations in the dielectric constant of the fuel being measured. Calibration procedures require proper electrical adjustments so that the indicator will respond properly to a specified capacitance signal.

Two methods of calibration that maintenance personnel will most likely encounter can be referred to as 1: Preferred calibration and 2: Alternate calibration. Preferred calibration will produce a true indication; alternate calibration is a temporary but expeditious measure, which results in indications which are not as accurate.

In the preferred calibration method, it is essential that these three requirements be rigidly adhered to:

1. The fuel tanks *must be* EMPTY.

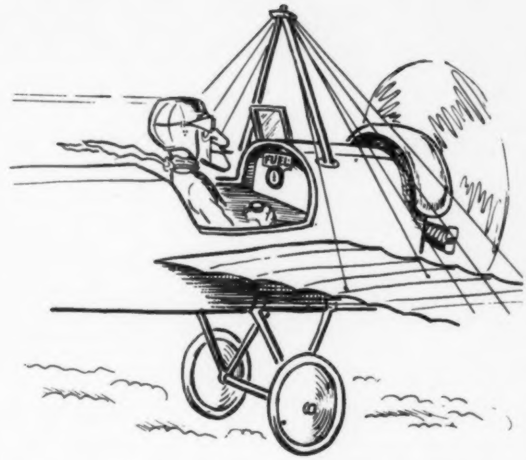
2. The fuel quantity components and associated wiring must be known to be in proper condition.

3. Up-to-date MD-1 and MD-2 testers should be used (see illustration). Personnel are cautioned to refer to, and to use, the procedures related to the particular aircraft being calibrated. Special factors such as compensators and simulators must be properly considered.

Why calibrate an empty tank? Remember that as the fuel quantity pointer approaches ZERO, the accuracy of the indication becomes paramount. Furthermore, modern capacitance fuel quantity systems indicate pounds of fuel. As the weight of fuel per given volume is dependent upon temperature, it follows that calibration of fuel quantity systems with tanks empty will eliminate one source of error.

The alternate calibration method is accomplished by qualified personnel on a properly functioning system with specified test equipment but with the fuel tanks not empty. A fuel quantity system calibrated by this method should be recalibrated by the preferred method at the earliest opportunity. Accumulated tolerances of components and test equipment introduce undefinable variations so that an alternate calibration is not a true calibration.

If a fuel quantity system is known to be malfunctioning, an exact description of the symptom is a necessary starting point. This is essential since there may be several factors that could cause



the malfunction. Next, the trouble must be localized to a specific portion of the system or on a particular unit by using the authorized testers listed in Figure 1. See the appropriate handbook of service instructions for detailed troubleshooting for the type of system involved.

The MD-1 can be substituted for the tank unit. This serves to isolate the trouble to one of two areas. Tank units, cables and wiring should be checked by using an MD-2. The systematic check may suggest a check of the fuel tank for water or other contaminants. It may be necessary to check the system power source, its regulated voltage and frequency tolerances. The fuel quantity calibration should be accomplished by qualified personnel only. Before calibrating a system, certain fundamental factors must be positively established, i.e., the tester to be used must be in satisfactory working order and the test leads must be in good condition.

In summary, the following procedures if adhered to, will greatly improve the reliability of aircraft fuel quantity systems:

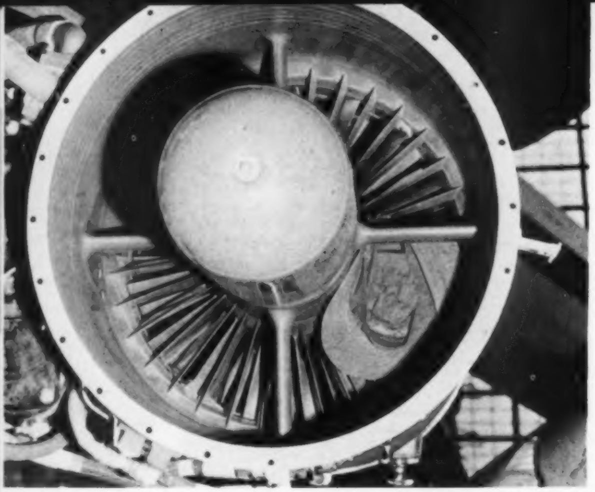
1. Whenever possible the system should be calibrated using the Preferred Calibration procedure.

2. In the event that the Preferred Calibration procedure cannot be used, the Alternate Calibration method should be used.

3. Only qualified personnel should make any adjustments.

4. Systematic troubleshooting methods should be used.

5. Cables, connectors and components should be inspected at regular intervals. ●



BEWARE DOMESTIC OBJECT DAMAGE—A maintenance man was drawn into port engine intake of a *Banshee* while performing post-inspection fuel integrity checks. See photo above.

The man was not injured. However, this carelessness on the part of maintenance resulted in an engine change costing $4000. The duct screens were not in place.

Indiscriminate Appetite—Engines of another *Banshee* were being run up at 55% rpm to parallel generators. A Marine tech sergeant (electrician) dismounted from the port side of the aircraft and went beneath the aircraft to work on the port engine voltage regulator. He was drawn headfirst into the port engine intake duct which was unscreened.

The mech in the cockpit heard a thud and the port engine began to shudder. Seeing that the man had been sucked in he immediately shut down the engines, pulled the electrician from the intake and went for assistance. The electrician sustained only minor injury.

One set of intake duct screens was available but not used. The majority of intake duct screens had been airlifted out about one hour prior to the squadron's deployment aboard a carrier and whether these men were aware that screens were available is not known. The anxiety to get the aircraft ready for the fly away probably accounted for the electrician's carelessness and the resultant accident.

The reporting activity noted that its squadron order requires the use of intake duct screens at all times when engines are being run up for ground checks and maintenance. This order has been and will continue to be emphasized to all personnel with occasion to be near the danger area of jet engines.

Eats Loose Tools—During installation of a new jet engine in an FJ-3 night check maintenance crew left two pairs of pliers on the aft part of the starter-generator housing near the compressor inlet. The engine was installed under conditions of poor lighting and the pliers were not detected during installation.

The engine was turned up for functional check the next morning. One pair of pliers was rejected by the intake, and the other entered the compressor.

Inlet guide vanes in the first three stages of compressor stator blades were completely destroyed. The engine had to be replaced.

OIL CONSUMPTION, CLUE TOO—It is important to know exactly what's going on inside an engine. We have temperature and pressure gages, tachs, boost gages, fuel flow and power output indicators. All these tell us what the engine is doing at the moment we observe them. We don't have an instrument to tell us when there is abnormal oil consumption, but we do have a dip stick.

The exact quantity of oil added to an engine is vital information. When we add 50 gallons of oil to 4 tanks on one aircraft and put down 12½ gallons for each engine, we are completely clouding the consumption facts for all 4 engines, and passing up one of our best clues to indicate normal or abnormal engine performance.—*Aviation Mechanics Bulletin.*

FROM THE GROUND UP

Notes and Comments on Maintenance

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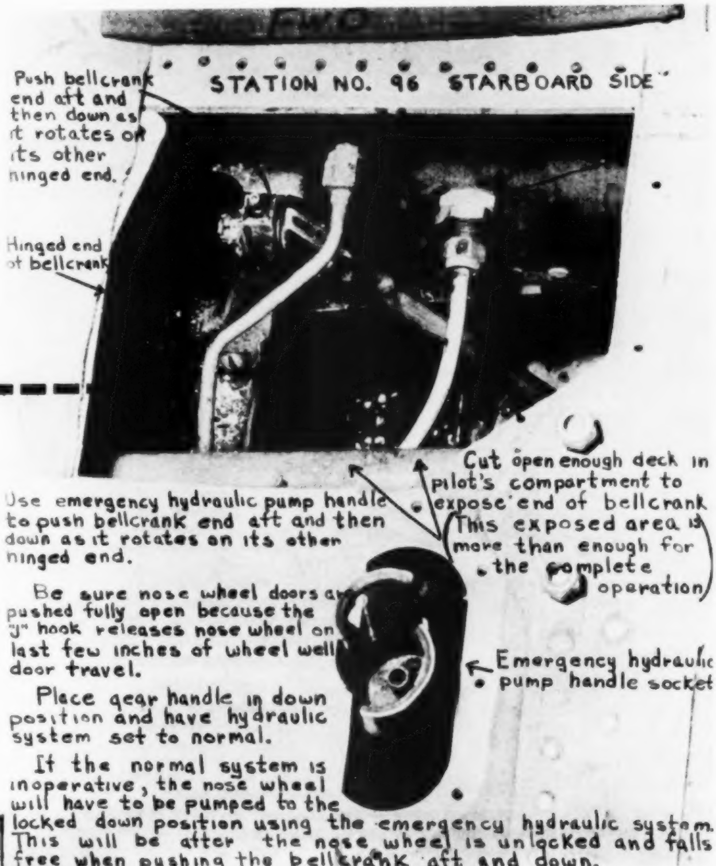
TO LOWER GEAR—

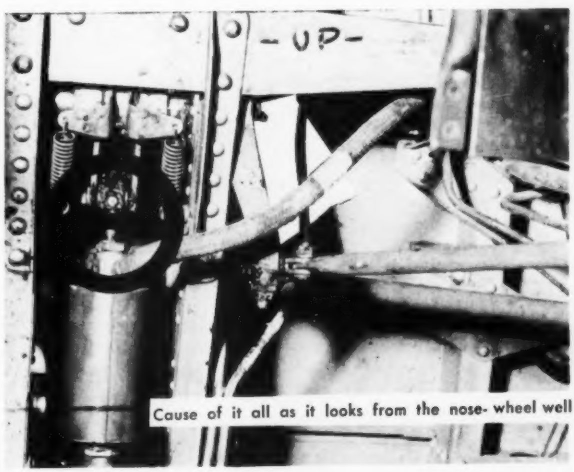
poke out

Failure of nose-gear door actuating cylinder rod-ends (See photo lower right) in S2F aircraft have necessitated certain in-flight emergency procedures to extend the nosegear (see illustration at right). By poking out cockpit decking (lower left) with EMERG hydraulic pump-handle, extension of the nosegear became possible. Pending incorporation of ASC 242 and/or providing an access hole, some squadrons now paint decking to mark the right spot.

A tip of the hat to the reporting unit for a FLIGA well prepared—Ed.



Result of probing cockpit deck for the right spot.



Cause of it all as it looks from the nose- wheel well

FROM THE GROUND UP

Continued

BY THE SEAMAN'S EYE—Maintenance personnel were servicing the nose strut of an F9F-2 aircraft with a high pressure air bowser. They were attempting to service the strut by using the length of the strut extension as a guide to the amount of pressure in the strut. No gage was being used.

When air was applied to the strut, the strut did not move. The mechanics erred in thinking they were not getting air pressure from the bowser when actually the strut was "bound." The man who was putting the air in the strut called for more air and upon receiving it the strut broke loose and the air pressure blew the nose of the plane about two feet in the air and blew the nose strut from the aircraft. Realizing what had happened the man applying the air crouched down in the nosewheel well but did not get his right foot inside. The aircraft fell back to the deck with the right nosewheel well door settling on the man's right foot. The man sustained a compound fracture of the right foot.

An endorsement of the report reemphasized:

Although there is no excuse for poor maintenance practices, it can definitely be concluded that many maintenance shortcuts are taken on the working level as a result of inadequate or improper equipment or facilities.

OPERATIONAL ASPECTS OF JET FUELS—The two principal fuels for jet and turbo-prop aircraft are (1) kerosene meeting certain quality standards with respect to combustion characteristics and freezing point, and (2) the wide-range gasoline type fuel known as JP-4.

Comparing the main specification characteristics of those fuels and their properties affecting performance and fire safety, the relative fire hazards are evaluated in the light of conditions in flight and on the ground. Conditions under which fire can develop and spread are discussed.

Static electricity is not regarded as a likely ignition source in the compartmented fuel tanks of an aircraft in flight, and a lightning strike of sufficient intensity to puncture the skin generally occurs at the extremities such as wingtips, edges of control surfaces, radio antennae . . . where fuel is not present.

In crash accidents where the fuel tanks are ruptured, kerosene has the advantage that the envelope of flammable vapor spreads more slowly than that of gasoline-type fuels and is more readily extinguished.

Cases are cited where accidents involving kerosene fuels either developed no fire or there was ample time for passenger escape. To the author's knowledge there is no case to date where known survivors of a crash have been prevented from escaping due to the spread of a kerosene fire in such an accident.

Hazards in fueling at the present and future high flow rates are considered to be controllable when adequate bonding and other precautions are taken.

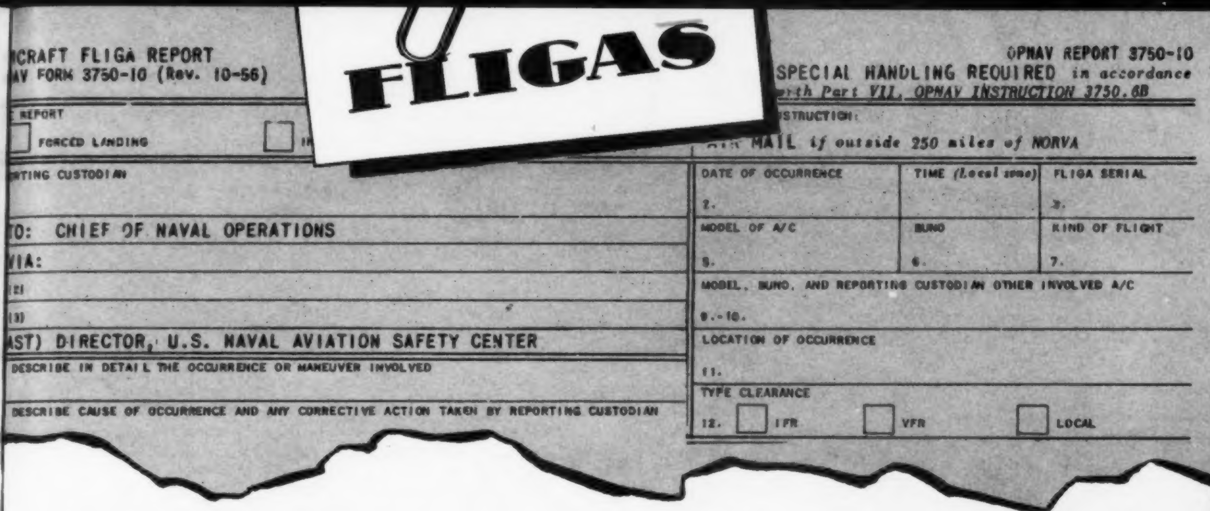
It is concluded that kerosene of 110° F. minimum flash point represents the best compromise in selecting fuel for the coming jet era.—*A. R. Ogston, "Esso Air World," Vol. 9, No. 2, September /October 1956.*

SERVICING AUXILIARY DRIVE UNITS OF THE F4D—The engine auxiliary unit, Stratos P/N 19301-4, has been squawked because of its poor oil filling provisions. It is possible to spill oil into the alternator air cooling openings below the oil filler neck.

To prevent this, extreme care and the proper equipment must be used for filling. The estimated amount of oil (1 to 2 tablespoonfuls will usually be enough) should be measured into a squirt can and then be squirted into the unit. Or oil can be poured into a clean container and then into the unit using a paper or glass funnel. If no funnel is available, covering the generator opening with rags is recommended.

The inspection handbook, NavAer 01 40FBA-506, calls for checking the oil level after each 50 hours of operation. The oil is drained after 250 hours of use. Only a small amount of oil will be needed to fill the unit. The total capacity is less than a quart.

Hot weather precaution: *Plastic canopies absorb heat from the sun and become hotter than the air inside or outside of the cockpit. This will cause crazing and deforming of the plastic. After securing canopies for rainstorms, etc., remember to reopen them slightly immediately following the disturbance to permit air to circulate freely inside of the cockpit.*



CRAFT FLIGA REPORT
AV FORM 3750-10 (Rev. 10-56)

FLIGAS

OPNAV REPORT 3750-10
SPECIAL HANDLING REQUIRED in accordance
with Part VII, OPNAV INSTRUCTION 3750.6B

REPORT
FORCED LANDING
STRUCTION:
MAIL if outside 250 miles of NORVA

RTING CUSTODIAN
DATE OF OCCURRENCE 2.
TIME (Local zone)
FLIGA SERIAL 3.

TO: CHIEF OF NAVAL OPERATIONS
MODEL OF A/C 5.
BUNO 6.
KIND OF FLIGHT 7.

VIA:
(2)
(3)
MODEL, BUNO, AND REPORTING CUSTODIAN OTHER INVOLVED A/C 9.-10.

AST) DIRECTOR, U.S. NAVAL AVIATION SAFETY CENTER
LOCATION OF OCCURRENCE 11.

DESCRIBE IN DETAIL THE OCCURRENCE OR MANEUVER INVOLVED

DESCRIBE CAUSE OF OCCURRENCE AND ANY CORRECTIVE ACTION TAKEN BY REPORTING CUSTODIAN
TYPE CLEARANCE 12. IFR VFR LOCAL

13. An F2H-3 was spotted on the port catapult of the carrier ready for launch. On clearing the aircraft after bridle hook up, the port bridleman was sucked into the port jet intake.

14. Carelessness on the part of the bridleman is the cause of the accident. Had the F2H-3 been without a duct door to stop his entry to the engine the man probably would have received fatal injury.

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13. An AD5W was taxied forward to obtain a ready deck and was being spotted on the starboard bow. The plane was taxied too close to the starboard catwalk and the starboard gear dropped off of the flight deck. The plane-captain, and plane-captain-in-training were walking alongside the starboard gear with tie-down reels. As the starboard gear dropped into the catwalk, they were crushed beneath the plane receiving class "Alfa" injuries.

14. The plane director directed the aircraft at an acute angle toward the starboard catwalk and misjudged its radius of turn. As the night was very dark, the pilot had to rely entirely on the plane director's signals.

SECOND ENDORSEMENT: This accident serves as a grim reminder that night flight deck operations must be under even more positive control than during dayight. The plane director had reported aboard from another aircraft carrier one week previously and had shown himself, during that week of continuous air operations, to be quite capable. He was using the technique of placing the left tire of ADs on the starboard catapult track, which is the guide for spotting ADs forward on the starboard bow. Such mechanical procedures must be checked visually whenever any doubt exists on the plane director's part and particularly at night.

All plane captains have been instructed to stay outboard of wing butts when accompanying aircraft being moved.

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13. A crew of three men were detailed to clean a WV-2 in hangar. The crew moved the equipment away from the aircraft. The fork-lift was parked ahead of the port wing. Man got on the fork lift to pull the steam jenny further away from the aircraft, started the engine, turned it around and drove aft along the port side of the aircraft. Without stopping, or hesitating he drove under the port wingtip of the aircraft and the vertical rails of the forklift struck the port wing tip fuel tank, ripping a hole in the bottom of the tank. The gasoline poured down in a deluge over the driver of the forklift. The driver jumped off, ran 20 feet. When asked if the ignition had been turned off, he ran back into the gasoline and secured the ignition of the forklift. The driver was sent to sick bay for treatment of possible fuel burns.

14. The driver had never driven a forklift before, and yet without authority or license he got on the forklift and drove it under the wing, not realizing the height of the forklift and its dangerous potential.

---

13. As an F2H-2P was turning up on the No. 1 catapult of CVA, a member of the catapult crew who had just hooked on the port bridle stepped in front of the port engine intake and was sucked headfirst into the intake. The engine was immediately secured and the man was removed to sick bay where he was treated for class C injuries.

14. The accident resulted when the man stood partially erect directly in front of a *Banshee* intake with the engine turning up at 100% and the intake screen removed.

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13. During a slow roll of an SNJ-6, pilot felt droplets striking his face. A loop was then executed, half way through the spray was experiencd again. This time it was determined to be acid. The pilot notified the tower and returned and landed.

14. Caps on battery were not in place, allowing battery acid to spill and run out through air drain. Hose on drain split at connection to battery, became disconnected, permitting acid to spray into cockpit during acrobatic maneuvers.

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13. Aircraft had just been catapulted from the carrier at night. An electrical fire occurred in the A. C. generator switch, located on the right console, which was extinguished by placing the battery switch in the OFF position. Inasmuch as both wingtip tanks were installed and full, it was necessary to jettison both tips in order to get down to landing weight as rapidly as possible.

14. Loose connections within the A. C. generator switch shorted

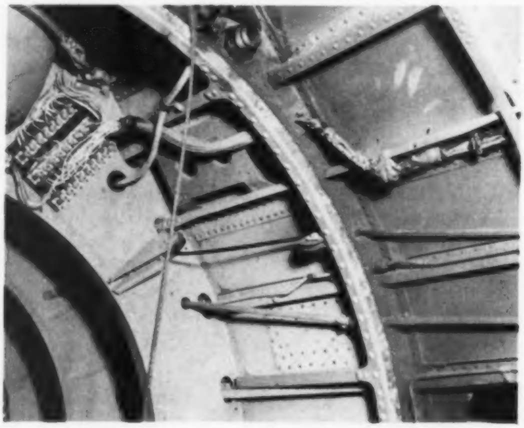
FLIGAS

Continued

out during the jar of the catapult shot, causing the fire. Maintenance crews have been cautioned to thoroughly inspect all replacement parts prior to installation.

13. An Aero 1A fuel tank was inadvertently jettisoned from the port inboard bomb rack of an AD-6 while executing a low angle loft maneuver on target.
14. This incident was caused by the Inboard Station Selectors being left in the ON position by the pilot. In addition, the pilot depressed the inboard instead of the outboard station pickle.

13. On takeoff, pilot of F9F-5 experienced loss of both normal and emergency trim tab controls, the tailhook warning light came on and the flight devices circuit breakers popped. The pilot performed a precautionary flameout approach and landed. Upon removing the tail section, maintenance personnel discovered a loose interconnector between the No. 7 and No. 8 combustion chambers.



Escaping gasses had caused damage to electric wiring, the No. 7 combustion chamber and burned a hole in a fuel drain line. See photo above.
14. A bolt securing the interconnector coupling to the No. 7 combustion chamber was missing. The escaping hot gasses ignited the magnesium emergency igniter and burned through the No. 7 combustion chamber, the fuel drain line and adjacent electric wiring.

To date 4 accidents have been reported which stemmed from a similar cause.—Ed.

13. F9F Turbine blade failure. Pilot was attempting to rendezvous with flight, reduced power to 75% and extended speed brakes. Then added power to 95% at which time a loud explosion was heard followed by continual buzzing sound. Vibration was slight. Proceeded to land without further incident.

14. This engine had exceeded TPT limits on previous flights.

BuAer commented: Since the information contained in the basic report is incomplete, a detailed analysis of the turbine blade failure cannot be made. Turbine blades are manufactured from an alloy very critical to prolonged maximum temperatures. Replacement blades for the J48-P-6BA engine, as well as blades for newer J48 engines, will be processed from an alloy less critical of extreme temperatures. It is of utmost importance, regardless of turbine blade material, that all flight personnel be continually instructed that the time of maximum allowable temperature be recorded in the respective engine log together with duration of the condition. This information will provide for a more realistic analysis of the failure involved.

Detailed instructions for exceeding maximum allowable temperature, which must be followed by all units using J48 engines, are contained in Service Instruction Handbook, paragraph 7-188D.

13. F4D—During high power turnup check a pilot reported RPM fluctuation. After 3 to 5 minutes of operation an outside observer reported large quantity of fuel coming from overflow vent line to the tail. The engine was secured and about one minute later an explosion was heard in the aft fuselage followed by two more in the same area at about two-minute intervals. Fire truck arrived within five minutes and extinguished the fire.
14. Failure of seal in B-nut which joins vent line to main tanks. All B-nuts are being broken down and seals inspected.

13. An F9F-5 was being weighed with C-1 Electric Scales. Reaction points used were jack points located at stations 68.50 (nose) and 258.00 (main). The aircraft was jacked up and the weights recorded without incident.

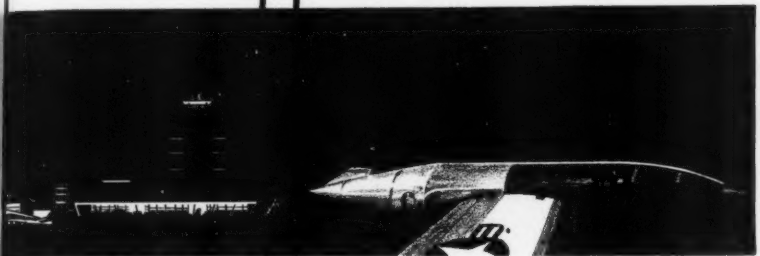
During the lowering of the aircraft the jack pad on the left wing station slipped from the top of the electric cell. The weight of the aircraft forced the jack top outboard and the resulting leverage knocked the electric cell jack adapter from the top of the jack. The jack shaft penetrated the left wing outboard of the jack point at wing station 60.5.
14. The left jack point was lowered at too fast a rate resulting in an unlevel and unstable position of the aircraft which resulted in the occurrence described above.

13. With battery switch and auxiliary hydraulic pump switch ON, the plane captain of F9F inadvertently activated canopy lever to the closed position while making preflight check. The canopy closed on the upper part of his body. (His head, upper part of shoulders and back protruding out of the cockpit.)
14. (a) This accident apparently happened as a result of carelessness upon the part of the plane captain. It is squadron doctrine that canopies be positioned in either a fully OPEN or CLOSED position. Further, while climbing in or out of the cockpit preflighting aircraft, both the battery and emergency hydraulic switch will be turned OFF.

(b) All personnel have been reindoctrinated in dangers inherent to power driven canopies.

(c) The canopy hydraulic actuating system was carefully inspected and there was no indication of system malfunction. ●

TIP TANK



Miscellaneous
aviation safety information

MARK 13 MODIFICATION

BuAer has endorsed and sent to BuOrd a requirement for a change to the igniter ring of the life vest day-and-night (Mark 13—Mod O) distress signal. The purpose of the change is to permit actuation of the signal under conditions wherein users may not have the finger dexterity required by the present design.

As part of BuAer's letter (Aer-AE-5231/40), a modification that could be made by squadron personnel was forwarded. This is accomplished by the following steps:

a. Remove the paper protective caps from both ends of the signal.

b. Bend the igniter rings with pliers to raise the flat side of the rings a minimum of one-eighth to one-fourth inch from the signal proper.

c. Reglue the paper cap in place.

OH, SAY CAN YOU SEE?

Replying to a query by a MAG concerning operation of aircraft in formation in IFR conditions, (particularly with respect to the new gray paint job), BuAer notes that "The use of position (navigation) lights as an aid to formation flying may be quite helpful under low visibility conditions . . . While the aircraft are in formation the lights should not be flashed.

"If the lights prove to be of assistance during join-up, they may be flashed to increase conspicuousness.

"The lights should be turned on STEADY as soon as the formation is established."

Considering the suggestion that formation lights are more effective than the position lights for purposes of maintaining formation under low visibility conditions, BuAer adds that "Some carrier model aircraft, such as the F3H and the FJ, are already equipped with formation lights," and that future requirements will specify formation lights for all carrier aircraft. A project to evaluate formation light requirements has been established at NATC, Patuxent.

AYE, AYE, SIR!

From an ATU safety bulletin: "Very soon for most of you there will come the day of graduation from the Advanced Training Command. While here, you have been admittedly closely supervised and at times fortunately so. But on the day of graduation you become the keeper of your own soul. In order to prepare for that day, start using your head now, or later you may lose it.

GEAR WARNING

The suggestion has been made that the red warning light which indicates position of the undercarriage be located where it would have to be seen on every approach —inside the airspeed indicator.—*Flight Safety Foundation*

Ceiling and visibility minimums only make an approach legal.
OTHER FACTORS
may make it impossible!
With a 200-foot ceiling you may have only 20 seconds to make a safe landing after becoming visual.
RAF Bomber Command

OBSTACLE COURSE

Know the difference between this symbol $\boxed{\Lambda}$ and this one Λ ?

Mistaking one for the other could make a big difference if you insist on trying to sneak home under the weather on one of those "marginal" VFR clearances, or plan a low-level nav hop too casually.

As you may have guessed the symbols indicate an obstruction; Λ means an obstruction extending 500 feet or less above the ground and $\boxed{\Lambda}$ indicates an obstruction extending 500 feet or higher above the ground.

Quite a few $\boxed{\Lambda}$ will represent radio and television towers. The Federal Communications Commission notes that there are 44 television stations operating with antennas 1000 feet or higher. Altitudes of these steel blades in the sky go up to 1610 feet.

Any time devoted to a study of the sectional charts along your route will be minutes well spent. Also the Airman's Guide regularly has an up-to-date obstruction list which may *list* new towers *not on the charts*.

Note: Some television towers are now abandoned and not lighted. CAA is attempting to get FCC action on this.

TIP TANK

Continued

CROSS PATCH

In order to expedite traffic at many busy airports or naval air stations, tower operators will frequently approve a pilot's request to use a runway other than the duty runway or may themselves request a pilot to use such a runway. There is no doubt that this system will move traffic faster but with airplanes moving in different taxi patterns greater cockpit vigilance than normal should be maintained.

ALPA's "Technical talk for pilots" recently carried an incident which should serve to point out the dangers of not keeping the eyeballs uncaged.

A pilot reported he was ready for takeoff on runway ONE LEFT and as soon as a plane had landed on runway TWO EIGHT and cleared the intersection takeoff clearance was granted. The pilot added power and began rolling.

Suddenly he heard the tower say, "Watch out for that airplane!"

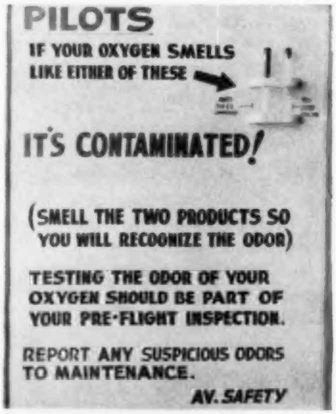
Another airliner was approaching the runway from the left on an intersecting taxiway and it became apparent he wasn't going to stop. The takeoff was aborted—brakes and reverse pitch used, and the plane stopped 50 to 75 yards from the taxiway intersection. By then the other plane had stopped and backed off runway ONE LEFT by reverse pitch.

The offending plane's taxi clearance had been from the concourse to runway two-eight. The tower operator had not been able to break in and warn the taxiing plane to hold short of runway as the pilots were reading back their ATC clearance at the time.

"READY TO"

A HUP-2 was spotted aft on the cruiser's fantail with doors and windows open during firing of five-inch and three-inch mounts. Concussion knocked out a section of the forward canopy.

ComAirPac Instr. 3710.1B (*and similarly ComAirLant Instr. 3700.5A—Ed.*) states helicopters should always be kept clear of muzzle blasts and taken below, if possible, during firing. As there are hazards involved in hoisting helicopters, it was further recommended by the reporting custodian involved that the best over all procedure to prevent occurrences of this nature in cruiser/helicopter operations is to have the helicopter airborne, if possible.



Thanks to NAS St. Louis for forwarding this interesting safety display. Since oxygen, either liquid or gaseous, is odorless, any smell in your oxygen mask other than the rubber smell of the mask itself, is wrong. Report it like the man says.

NIX ON JAM SWITCHING

HUP pilots are cautioned to avoid "jam switching" rotor gears! Always be certain rotor RPM is synchronized with engine RPM *before* actuating the jaw clutch.

The HUP clutch is rugged, but something's gotta give when the jaw is actuated *before* both engine drive shaft and the clutch shaft are turning together. Several HUP accidents have been caused by pilots being over-eager to "jaw clutch."

When engaging the HUP clutch:

1. Head the helicopter into the wind.
2. Wheel brake lever: ON.
3. Throttle: 1200-1500 rpm (During rotor engagement do not allow RPM to drop below 800. Do not open throttle; a shot of prime will increase the RPM without danger of engine overspeed).
4. Collective pitch: DOWN and LOCKED.
5. Controls: NEUTRAL.
6. Rotor brake: OFF.
7. Friction switch: ON (needles should synchronize in 8-15 seconds).

The 8 to 15 second time element is important. By allowing less than 8 seconds on clutch engagement there is danger of causing damage to the drive and rotor systems through severe shock loads by going into direct engagement.

If more than 15 seconds elapse, excessive heat being generated in the clutch may distort and warp the friction plates.

The clutch should never be engaged when the engine speed is above 1500. The engine should only be started when the friction and jaw clutches are disengaged.

8. *When rotor and engine RPM synchronize* hold jaw switch on until amber light goes out, (2-5 sec., 5 sec. maximum).
9. Warm-up: Observe rotor drive shaft and adjust as necessary for minimum vibration, (approximately 1600 rpm).

Well Done....

To the citizens of Winslow, Arizona, and particularly to:

- ★ Mr. Mel Merritt, Chief of Police
- ★ Mr. Harvey Randall, Sheriff Patrol member
- ★ Mr. Norman Randall, cattle rancher
- ★ Dr. M. D. Spirtos, physician
- ★ Mr. Carl S. Kelley, CAA control operator, Winslow Airport
- ★ Miss Stella R. Myers, CAA radio operator

who participated in the rescue of the 11 members of the crew of a P2V forced to abandon their airplane, WELL DONE.

On a night late in January the P2V had departed NAS Los Alamitos for a flight to NAS Hutchinson. Twenty minutes after passing Winslow, the port engine caught fire and was feathered. The plane was turned towards Winslow, but the remaining engine soon began to fail. With altitude and airspeed both dropping, the pilot ordered the crew to bail out into a dark, snowy, night sky.

The area around Winslow is open mesa, elevation about 5000 feet. It's sparcely populated ranch country. A light snowfall, temperature 30° F and 11 men (one with a broken leg) were scattered out in about 20 square miles!

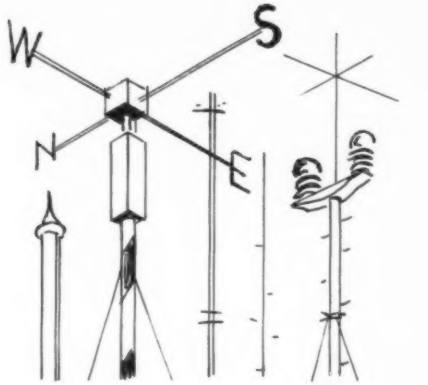
Mr. Kelley, in the Winslow tower, who had been in voice contact with the P2V shortly before the crew parachuted, saw the fire from the airplane crash. He and Miss Myers alerted Mr. Merritt, Mr. Scott and Dr. Spirtos. Mr. Harvey Randall had two-way radio installed in his pickup truck, and Mr. Kelley was able to direct him toward the burning aircraft.

Mr. Randall soon had 6 of the 11 crew members in his truck and got them to a shelter and a fire. At this time, another of the P2V crew, attracted by the lights, walked up and told of the man with the broken leg lying about four miles away, attended by another crewman. The party drove off to the rescue of the injured man.

Meanwhile, Mr. Norman Randall, Mr. Scott and the doctor drove an ambulance cross-country and simultaneously arrived where the injured man lay. Nine of the crew were now safe.

Mr. Norman Randall led a search group toward the crashed plane and the other two members of the crew were rescued.

Shortly before dawn on 28 January 1957 the rescue operation was completed and everyone was safe in Winslow. The outstanding efforts of the men and women of this Arizona city are deserving of the highest praise, and to this end, Naval Aviation salutes you!



aerographer.....

'DO' POINT

Ever since Sam Clemens made his wryly classic comment regarding the weather, people have applied a great deal of effort to that very problem of doing something about it.

The success of that effort is attested by the simple fact that today's pilot may file a flight plan to a point distant in miles, time *and* prevailing weather conditions—and do so with reasonable assurance that the prediction will prove out.

The source of this capability is the Aerographer, and the tools of his trade—weather balloons, sequences, station models, millibar charts, anemometers, psychrometers, barometers — are as numerous and different as the varying information which he translates. By any conservative estimate, the Aerologist's information is accurate more than 90 percent of the time, and for those of us who are prone to recall only the instances of "bum guesses," there is one additional tool which should do wonders toward bringing the Aerologist's efficiency comfortably near 100 per cent.

This *you* can do: Get to know your aerologist and his problems, and invite him to observe the problems of your flight operations mission. Few people are more consistently available to assist you, 24 hours a day, and the areologist can do just that. And you couldn't do better in your search for more effective flight operations *to save your life!*